Environmental & Social Impact Assessment Report

Mano River Union Road Development and Transport Facilitation Programme (MRU/RDTFP) Phase-III

Paving of Putuken – John Davis Town Road Corridor (50Km) River Gee and Grand Gedeh Counties

MINISTRY OF PUBLIC WORKS

THE GOVERNMENT OF LIBERIA

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LIST OF ACRONYMS

AC ....Asphalt Concrete
ADF.....African Development Fund
AfDB ....African Development Bank
ARAP..... Abbreviated Resettlement Action Plan
Db ....Decibel
E&S ....Environmental and Social
EPA ....Environmental Protection Agency
EPML ....Environmental Protection and Management Law of Liberia
ESIA ....Environmental and Social Impact Assessment
ESMP ....Environmental and Social Management Plan
FDA..... ....Forestry Development Authority
FRAP..... .Full Resettlement Action Plan
FTHRP ....Fish Town-Harper Road Project
GOL .....Government of Liberia
GRM ....Grievance Redress Mechanism
HIV/AIDS ....Human Immunodeficiency Virus
ISS..... Integrated Safeguards System
km ....kilometer
LEC .....Liberia Electricity Corporation LWSC
....Liberia Water and Sewer Corporation m^3
....Cubic meter
MME .....Ministry of Mines & Energy
LLA..... Liberia Land Authority
MOJ..... Ministry of Justice
MOT .....Ministry of Transport
mm ....millimeters
MPW ....Ministry of Agriculture
MoFDP ....Ministry of Finance, Development and Planning
MoL..... ....Ministry of Labour
MPW ....Ministry of Public Works
MRU/RDTFP ....Mano River Union Road Development & Transport Facilitation Programme
NOx ....Nitrogen oxides
OSs .....Operational Safeguards

PAPs .....Project Affected Persons
PIU ....Project Implementation Unit
PM ....Particulate Matters
PPE ....Personal Protective Equipment
PPM.....Parts per million
RAP .....Resettlement Action Plan
RE .....Resident Engineer
ROW .....Right of Way
SO_2 .....Surfer Dioxide
TOR.....Terms of Reference
UA .....Unit of Account
UNEP .....United Nations Environment Program
VRU .....Vulnerable Road User

EXECUTIVE SUMMARY

Background

The Government of Liberia (GOL) has identified road infrastructure development as one of the key areas of its development agenda. The country's road network is in deplorable condition and needs urgent attention in order to drive economic activities around the country. It is believed that of the estimated 10,538Km of public roads in Liberia, only a minute portion about 7% (734 Km) are paved. In this regard, the Governments of Liberia is in talk with the African Development Bank (AfDB) to construct portion of the 510Km of Ganta to Harper road that linked three (3) south-eastern counties (Grand Gedeh, River Gee, and Maryland counties) with an estimated population of one (1) million (25% of Liberia's population). Also, the three (3) counties by extension link Liberia to Ivory Coast via the Cavalla Customs in Maryland County which forms part of the Mano River Union Road Development and Transport Facilitation Programme as well as the Trans-African Highway. The proposed road project (Putuken to John Davis Town (50Km)) which, formed part of LOT-3 (Zwedru to Fish Town in Grand Gedeh and River Gee counties) is a continuation of the 510Km road development from Ganta/Nimba County to Harper/Maryland County. The entire 510Km road corridor was portioned into two (2) Sections. Section 1 is the road from Ganta, Nimba County to Zwedru, Grand Gedeh County, while Section 2 is the road from Zwedru, Grand Gedeh County to Harper and Harper Junction to Cavalla Custom in Mary Land County.

Section 2 under which this report covered, was further phased into three (3) LOTS:

- Lot 1, for which construction work has been constructed to the asphalt pavement, consists of the reconstruction of the laterite road from Harper to Karloken (50km) and Harper Junction to Cavalla Custom (16km) in Maryland County.;

- LOT-2, which is currently under construction, consists of the section of road from Karloken, Maryland County to Fish Town (80 Km) in River Gee County and is about 86% complete; and
- LOT-3 is 130Km and consists of the following sections of road: (Fish Town to Kilepo (20Km); Kilep to Putuken (11.5Km); Putuken to John Davis Town (50Km) and John Davis Town to Zwedru (48.6Km) in River Gee and Grand Gedeh Counties. Currently under consideration by the GOL and the AfDB for paving is the section between Putuken to John Davis Town (50Km) for which this ESIA studies have been conducted.

The road when paved, will not only make it adatable to the adverse climatic conditions but also protect the current investment in addition to other socio-economic benefits associated with road improvement, greatly reduce the high cost of transportation and improve the living stanadards of the people. It aims at reducing travel time and vehicle operating cost by improving the road alignment and pavement condition. The road project will also enhance the flow of regional and inter regional traffic and trade, and reduce road user costs, thereby strengthening regional economic integration. The road safety measures that would be put in place will enhance safety standards on the project road. In addition, the project will also facilitate easy access by farmers and traders to social services along the corridor expected to generate more income to augment the Government's effort in achieving economic development and poverty reduction.

In keeping with the AfDB's Integrated Safeguards System (ISS) and national regulatory requirements, the Ministry of Public Works has prepared this ESIA including a stand-alone ESMP and a RAP for the proposed road project: **Paving of Putuken to John Davis Town**

(50Km) in River Gee and Grand Gedeh counties under the auspices of the Mano River Union Road Development and Transport Facilitation Programme (MRU/RDTFP) PhaseIII. The report is essentially an update of the ESIA report prepared by the Ministry of Public Works for road section between Fish Town and Gbagbo Town in 2013.

The Purpose and Need for The Project

The proposed road rehabilitation is an important component in the revitalization of Liberia, a country rebuilding its infrastructure, rehabilitating its economy, attracting investment, and improving the livelihoods of its citizens following years of civil unrest and conflict. The Liberian government is developing strategies and policies to promote sustainable development and sound environmental management. The infrastructure constraints are the major impediments to economic recovery and growth in Liberia. One of the main challenges faced by the country is the limited road transport connectivity.

Adopting a sustainable road asset management strategy for creating durable transportation networks and ensuring their preservation is central to the sustainable development that the GOL is endeavoring to promote and develop. Improvements made in the road and in the transportation, sector will be instrumental in:

- Improving inland connectivity to the inaccessible and deprived rural areas;
- Reducing transport and material costs by improving accessibility;
- Improving health and sanitation;
- Improving access to services;
- Enabling farmers to sell their goods and gain better prices, raising incomes
- Reducing poverty and hunger;
- Establishing employment, training, human resource development, and technology transfer opportunities;
- Increasing the earning potential;
- Enabling industrial and commercial growth; and
- Encouraging community and rural development.

This corridor is vital to the nation's reconstruction effort and the improvement of regional cross-border traffic, which will enhance Liberia's trade and interconnection with its neighbors: Ivory Coast, Guinea and Sierra Leone. The road has the potential to open up the south-east of Liberia and contribute to the delivery of government services such as health and education. The road will link the south-eastern counties to the planned dry port near Ganta.

LEGAL AND INSTITUTIONAL FRAMEWORK

Legal Framework

Several national policies, regulations and laws are applicable to this project including the Constitution of the Republic of Liberia, specifically Article 7, which sets the basis for legal and institutional framework for the protection and management of the environment in Liberia, the Environmental Protection Agency Act (2003), National Environmental Policy, and the Environment Protection and Management Law (EPML, 2003). Section 6 of the EPML places a mandatory requirement for environmental screening and/or Environmental Impact Assessment of all investment works or projects that are likely to have significant adverse environmental impacts with subsequent issuance of licensing or permitting from the Environmental Protection Agency of Liberia (EPA) as stipulated in the legislation.

There are several other regulations, policies, and laws that are relevant to E&S governance (including occupational health and safety) in Liberia. They include the National Environmental Policy (2002), Land Rights Act (2018), Land Administration Policy (2015), National Environmental and Occupational Health Policy (2010), and the Decent Work Act (2015).

African Development Bank Integrated Safeguards Requirements

The African Development Bank (AfDB) has established the Integrated Safeguards System (ISS) as a comprehensive environmental and social risk management framework to ensure that Bank-financed operations promote inclusive growth, environmental sustainability, and social equity across its Regional Member Countries.

The ISS is a cornerstone of the Bank's operational strategy and applies to all public and private sector projects financed by the AfDB. It is designed to:

- Identify and assess environmental and social risks and impacts at an early stage of project preparation;
- Avoid, minimize, mitigate, or compensate for adverse impacts;
- Strengthen borrower capacity for environmental and social management;
- Promote transparency, accountability, and stakeholder participation; and
- Enhance long-term project sustainability and development effectiveness.

Safeguards serve as a preventive and corrective tool. By systematically identifying risks—such as involuntary resettlement, biodiversity loss, community health and safety risks, labor issues, and climate vulnerability—the ISS reduces potential project delays, reputational risks, and financial costs. Ultimately, it ensures that affected communities are protected and that environmental resources are sustainably managed.

Operational Safeguards under the ISS

The AfDB ISS comprises ten (10) Operational Safeguards (OS), which collectively address environmental and social risk management across the project lifecycle. These safeguards cover issues such as:

1. Environmental and Social Assessment
2. Involuntary Resettlement
3. Biodiversity and Ecosystem Services
4. Pollution Prevention and Resource Efficiency
5. Labor and Working Conditions

6. Community Health, Safety, and Security
7. Vulnerable Groups and Gender
8. Cultural Heritage
9. Climate Change Risk Management
10. Stakeholder Engagement and Information Disclosure

Based on the scope, scale, geographic footprint, and anticipated impacts of the project, all ten (10) Operational Safeguards have been triggered. This reflects the project's complexity and the range of environmental and social sensitivities associated with its implementation, including land acquisition, livelihood impacts, biodiversity considerations, occupational health and safety risks, and community engagement requirements.

Project Categorization under the ISS

In accordance with the ISS classification criteria, the project has been categorized as Category 1.

Category 1 projects are those likely to result in:

- Significant adverse environmental and/or social impacts;
- Impacts that are irreversible or unprecedented;
- Impacts that may affect broad areas beyond the immediate project footprint; or
- Significant cumulative or induced impacts.

Category 1 classification requires the highest level of environmental and social due diligence.

This categorization is consistent with national environmental legislation, which mandates a full Environmental and Social Impact Assessment (ESIA) for projects of this nature and scale. The national requirements align with AfDB standards in requiring comprehensive assessment, mitigation planning, stakeholder consultations, and public disclosure.

Required Safeguard Instruments

Given the Category 1 classification and the triggering of all ten Operational Safeguards, the following safeguard instruments have been prepared:

1. Full Environmental and Social Impact Assessment (ESIA)

The ESIA provides:

- A detailed description of the project and alternatives considered;
- Baseline environmental and social conditions;
- Identification and evaluation of potential impacts (direct, indirect, cumulative, and induced);
- Climate risk and vulnerability assessment;
- Stakeholder engagement documentation; and
- Proposed mitigation and enhancement measures.

The ESIA serves as the principal environmental and social due diligence document for the project.

2. Stand-Alone Environmental and Social Management Plan (ESMP)

A comprehensive and stand-alone Environmental and Social Management Plan (ESMP) has been developed in accordance with AfDB requirements. The ESMP:

- Translates mitigation measures identified in the ESIA into actionable commitments;
- Defines roles and responsibilities for implementation;
- Provides monitoring indicators and reporting arrangements;
- Includes capacity-building measures;
- Establishes cost estimates and budget provisions; and
- Integrates contractor obligations into bidding and contractual documents.

The ESMP ensures that mitigation measures are not merely conceptual but operationalized throughout construction and operation phases.

3. Resettlement Action Plan (RAP)

In line with the Operational Safeguard on Involuntary Resettlement, a full Resettlement Action Plan (RAP) has been prepared. The RAP includes:

- Socioeconomic census and asset inventory of Project Affected Persons (PAPs);
- Valuation methodology and compensation framework;
- Livelihood restoration measures;
- Vulnerable group assistance measures;
- Grievance Redress Mechanism (GRM);
- Institutional arrangements;
- Implementation schedule; and
- Budget and financing plan.

The RAP ensures that affected persons are compensated at full replacement cost and that their livelihoods are restored or improved relative to pre-project conditions.

Disclosure Requirements

Transparency and stakeholder participation are central principles of the AfDB ISS.

To comply with the Bank's disclosure policy:

- The ESIA, ESMP, and RAP must be disclosed both in-country and on the AfDB's official website.
- Disclosure must occur at least 120 days before the project's consideration by the AfDB Board of Directors for Category 1 projects.
- In-country disclosure shall include making documents accessible at relevant government institutions, local administrative offices, and other public locations accessible to affected communities.
- Summaries may be translated into local languages where necessary to ensure meaningful consultation and informed participation.

The 120-day disclosure period allows sufficient time for public review, feedback, and incorporation of stakeholder concerns before final project approval.

The AfDB Integrated Safeguards System establishes a robust framework for managing environmental and social risks in development projects. The triggering of all ten Operational Safeguards and the Category 1 classification underscore the significance and complexity of the project.

Through the preparation of a full ESIA, a stand-alone ESMP, and a comprehensive RAP—along with strict adherence to disclosure and consultation requirements—the project aligns with AfDB standards and national environmental legislation. These measures collectively ensure that the project contributes to sustainable development, protects affected communities, and safeguards environmental integrity throughout its lifecycle.

Institutional Framework for Environmental Governance

Several institutions are responsible for environmental and social management in Liberia, including the EPA and relevant ministries and agencies, and other governance structures at the level of the local government. The EPA is however the lead agency for the management of the environment in Liberia. Other agencies and ministries with environmental management responsibilities that the EPA coordinates with include the Ministry of Mines and Energy (MME), the Ministry of Agriculture (MoA), the Forestry Development Authority (FDA), and the Liberia Land Authority (LLA). Other institutions, including the Ministry of Gender and the Ministry of Labour have various responsibilities and coordinate with the EPA as well.

PROJECT DESCRIPTION

Project Development

The overall objective of the third Phase of the Programme (as was the case with the ongoing two phases) is to boost the post-conflict economic recovery of the three countries in the MRU region by improving road infrastructure and promoting intra-community and regional trade. Specifically, the Programme seeks to improve transport conditions on the two road sections and bridge in order to reduce transport costs, facilitate the free

movement of persons and goods between the two countries and improve the living conditions and wellbeing of programme area communities.

The expected outcomes include: (a) reduced transport costs and travel time; (b) enhanced potential for agriculture thereby contributing to food security and alleviating poverty among communities on the corridors; (c) improved road safety and social wellbeing and (d) improved regional trade and integration.

Project Components

The project has four components including the following: (i) Road development and mitigation of negative environmental impacts, (ii) Social Infrastructure and Institutional support measures, (iii) Transport and Trade facilitation, and (iv) Programme management

Project Location

The Ganta – Harper road network runs from North-eastern Liberia to South-eastern Liberia. Section 2 – Zwedru – Harper runs entirely in the south-eastern part of Liberia. This section has been divided into three (3) lots. This ESIA covers Lot 3 for the section beginning from Putuken to John Davis Town (50Km) situated in Chedepo and Putu districts in River Gee and Grand Gedeh counties, respectively.

BASELINE CONDITIONS

The Existing Bio-Physical Environment

The Putuken to John Davis Town road runs across the forested landscape of the Liberian hinterland. The terrain is gently undulating, consisting of the weathered lateritic peneplain of Southeast Liberia. This has few rock outcrops, but deep, strongly weathered soils. The soils are ferralsols (latosols or laterites), rich in iron and aluminium, generally quite infertile and highly erodible where they are disturbed or vegetation is removed. The landscape is

highly dissected by small creeks, and larger streams and rivers, which drain into the Cavalla River.As for the whole of Liberia, the climate is humid tropical with pronounced wet and dry seasons, running from May to October and November to April respectively. The average annual rainfall is in the range of 1700 to 1800 mm. June, July and September are usually the wettest months, and December and January the driest.

The road corridor runs through an area that was previously fully forested. This forms part of the Upper Guinea evergreen hardwood tropical rainforest that originally ran right across West Africa, but which now has some of its main relics in Liberia. It is very species diverse, with over 2200 vascular plants. There are no protected areas or other conservation sites in the vicinity of the project location, and the habitats all appear to be modified. All of the forest near the road is now either disturbed degraded by former shifting cultivation or logging, or has been replaced by active shifting cultivation, sedentary lowland rice cultivation, or tree plantations.

There is frequently a blurred distinction between forest and agriculture in this landscape, partly because the prevailing shifting cultivation system moves land from forest to farm for a short period, followed by a long fallow period during which the abandoned land becomes bush until forest re-establishes itself to some extent. Farming households also depend on the remaining forest for a wide range of non-timber forest products and bush meat. In addition, many tree plantations are under-managed, so that they are difficult to distinguish from secondary forest.

The broad biodiversity of the forest plants is complemented by a significant animal biodiversity. This is clearly depleted from what would be found in primary forest, but is still likely to be considerable in some areas. There are no large mammals in the road corridor, but the forests, bush and riverine areas, and even the active farmland and plantations,

provide modified habitats that still support large numbers of small mammals, reptiles, amphibians, birds and insects.

The water resources are abundant, both surface water and groundwater. A large number of creeks, streams and rivers are crossed by the road corridor. The sampling and analyses undertaken for the ESIA show that, although not pristine, these are generally clean enough to meet national drinking water standards. There are some exceptions, however, with raised levels of suspended solids suggesting that soil erosion has been increased by human activities in places. In a few locations, raised levels of nitrates and nitrites were detected, probably related to poor sanitation. There was also evidence of water contamination with petroleum hydrocarbons at two sites close to settlements. Runoff from the earth road must affect watercourses, though apparently only during and immediately after heavy rainfall.

Since most of the road passes through rural areas, and with relatively low traffic levels, air quality seems to be good during the wet season. Dust is known to be a significant nuisance during the dry season and will become worse during construction before being almost eliminated on the road itself as a result of the paved surface.

Ambient noise is currently also at acceptable levels, though it can exceed national standards for short periods locally. Examples of this identified during ESIA preparation were heavy machines operating, some agricultural activities and a celebration.

The Existing Socio-Economic Environment

The project proponent ensured that a Socio-Economic Survey (SES) was conducted of the Project Affected Persons (PAPs), who are the owners and tenants of structures within the right of way of the area – Putuken Town to John Davis Town (50 Km), River Gee and Grand Gedeh Counties. However, as the project proponent has already conducted RAP for Lot 1 and Lot 2, this assessment, even though branded as "Putuken Town, River Gee and Grand Gedeh Counties", begins just outside of the urban demarcation of Putuken.

Economic development has been held back by the condition of the road, which inhibits traffic and raises transport costs in the wet season. Farmers cannot sell produce easily as buyers cannot get to them and investment in tree crops is limited as transport difficulties mean it is not economically worthwhile harvesting the trees. Most farms are subsistence rice and cassava crops grown for home consumption. Income and expenditure data were not collected, but indicators of wealth were. Wealthier families tend to own vehicles, have generators and often have a non-agricultural business interest. The majority of wealthier households are located in the cities and larger towns. The emergence of new villages and hamlets since the 2008 census shows the pressure for agricultural land.

The illiteracy rate within the project area is 14% of the 144 persons interviewed. The number comprised of people over 15 years that have never attended school or unable to read and write. However, the data show most respondents had achieved at least five years of education. The rates for drop-outs and the numbers of children out of school are low. Most graduates identified in the survey are living in Swedru. Liberia has had a tremendous push towards improving the quality of and extending school networks into rural areas, and this is evident in the distribution of schools in the project area of influence.

ENVIRONMENTAL AND SOCIAL IMPACTS Potential Positive Environmental and Social Impacts/Benefits

It is clear that there is a strong need for the project, and none of the possible alternatives are credible in a country that aims for development and prosperity. Consequently, several positive benefits of the project are identifiable. These can be summarised below:

- Improved access to social services, including health and educational facilities.
- Reduced dust nuisance and less sediment in roadside watercourses from the current unpaved road.
- Enhance transport system that reduces transportation costs and this, in turn, reduces production costs while increasing the productivity and profitability of businesses.

- Makes transportation schedules and deliveries more reliable and timelier.
- Improve trading in the area and expand transboundary trading.
- Contribute immensely to social growth, relatives can visit their loved ones more often and it enhances good relationship between family members and friends.
- Reduce travel time to villages, cities and towns thereby encouraging people to travel for business and trade.
- Reduce road accident.
- Help reduce the cost of vehicle maintenance, when compared to vehicles subject to extraordinary rough physical treatment under poor road condition.

Potential Environmental and Social Risks and Impacts

Despite all the positive impacts, the project activities are expected to generate negative environmental and social risks and impacts that will need to be mitigated through the implementation of the measures provided in the project ESMP and the RAP. A summary of the potential negative impacts of the project are listed below:

- The removal of vegetation, and the risk of serious soil erosion and sediment supply into watercourses through the quarrying of materials and construction of major earthworks;
- General degradation of the environmental resources along the road corridor – especially the forests and watercourses, and the habitats they provide – as a result of the largescale project activities;
- Pollution of soil, water or air from the use or generation of hazardous materials;
- Danger of injury or death to both members of the public and project workers from construction activities, including traffic;
- Damage to social systems and community health as a result of a large transient workforce.

- Noise pollution and excessive vibrations: Communities directly along the route will experience noise pollution and vibration during the construction phase, but this will be short-term.
- Solid waste generation: It is difficult to estimate the amount of solid waste that will be generated, but a lot of solid waste such as tarmac waste, cement waste, and among other wastes will be generated during construction activities.
- The risk of spreading communicable diseases: The project will attract labour from all around the country as well as internationally which increases the risk for staff as well as community residents.
- The study and the RAP have identified several infrastructures, including 99 structures, six public utility structures, four graves, and one church will be directly affected.

  Several farms will also be affected along the route.

ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

A summary of the mitigation measures for the moderate and high risks and impacts are summarised in the below:

Table 1: Mitigation Measures for the Moderate and High Risks and Impacts

POTENTIAL RISKS AND IMPACTS	MITIGATION MEASURES

The project is expected to acquire unspecified amount land area for borrow pits, quarries, and camp sites	The acquisition will be done in conjunction with the local community. The project has developed environmental and social criteria that will be used during site selection Cultivable lands will not be used as borrow pit sites for excavation of construction materials, unless other sites have been exhausted. Siting of quarries far from communal settlements, providing adequate buffer zones and adopting best available and safest controlled blasting techniques. The project will ensure that separate ESMPs are prepared for the management of quarries, borrow pits, campsites, and other associated facilities. The project will ensure that sites acquired by the contractors for the activities/facilities mentioned above are approved by the Ministry of Public Works/PIU. The project will ensure that sites are reinstated as much as possible to their previous states.
Contamination of soil by fuels, oil spills and lubricants	Refueling and maintenance will be allowed only in designated areas with impervious surfaces. Fuel storage and refilling areas will be located at least 300 m from drainage structures and important water bodies (rivers, water pans etc). All fuel and hazardous material shall be stored in special designates facilities away from the river. The storage shall be roofed and have a concrete floor with a bund for secondary containment and collection of spills. Storage areas shall be designed such that they will contain 110% of the largest

	container/vessel stored in the storage area; suitable clean-up equipment and material needs to be on site. All spoils and wastes will be disposed of as per approved disposal plans in wastelands, and in consultation with the county environmental administrators and local communities. Bituminous wastes will be disposed of at approved sites with impervious linings.
Air Pollution due to Dust Generation and Exhaust Emissions	Sprinkling of water on dry and dusty surfaces regularly including the access roads and diversions. All precautions to be taken for reduction in dust emissions from batching and/or hot mix plants and crushers, etc. Adherence to personal protective clothing such as the use of dust masks and respiratory masks by workers. Speed limit regulations will be enforced on site by the contract. The contractor must ensure proper and regular maintenance of machineries and vehicles The contractor will provide and install dust nets around batching plants.
Noise Pollution and Vibrations during Construction (there are 21 villages/settlements along the road from Kailahun – the end. However, no sensitive receptors were identified because schools and hospitals are located at a safe distance from the road).	The contractor will ensure that all vehicles and construction machinery are kept in good condition at all times to avoid excessive noise generation. The contractor will enforce the use of protective gears (ear muffs and other personal protective gear/equipment) when working in noisy sections. The contract will ensure that all machines/equipment are switched off when not in use. Undertake loud noise and vibration level activities during off-peak hours during the day (i.e. between 8.00 am and 5.00 pm). Ensure the World Health Organization (WHO) bare minimum noise level is maintained for the eight working hours i.e. 85 dB.

Possible Displacement And Disruption Of Businesses Located Along Kailahun And Koindu Towns (23 No. of businesses/commercial activities identified to be affected by involuntary resettlement)	The affected community members will be informed early enough. The affected businesses will be compensated appropriately according to existing best practices on current market rates or mutually agreed rates. Explore the alternative of by-passing the road outside the towns to avoid displacement, The proponent will need to ensure that the final designs of the road will be realigned to ensure that displacements are minimized as much as possible.

	Ensure that the Resettlement Action Plan is done appropriately and professionally as per the laid Equator Principles and the AfDB guidelines. Provide support to squatters to establish small-scale businesses in other suitable locations of the two towns. Provide comprehensive environmental health and safety education to squatters along the road. Promote other sources of livelihood among the local communities.

Water Abstraction and Consumption	Install water conserving taps and toilets where possible e.g. in the base camps. Construct water pans and for storage of harvested storm water in conjunction with the local community members. Drilling of boreholes to supplement water obtained from other sources. Leave boreholes to the community after construction. Install gutters on the roof of houses in workers camps to harvest rain water.
Solid Waste Generation	Maximizing the rate of recycling of road resurfacing waste either in the aggregate (e.g. reclaimed asphalt pavement or reclaimed concrete material) or as a base. Collecting road litter or illegally dumped waste and managing it as provided for in the Environmental Management and Monitoring Plan. Provision of temporary waste handling facilities (litter bins) both during construction and operation phases
Energy Consumption (this is not an impact but leads to an impact on greenhouse gas emission)	Promote the use of solar energy and energy efficient bulbs in workers base camps and for street lights in settlements situated along the proposed road. Switch off lights when not in use. Install electricity meters to monitor the consumption of electricity in workers camps. Ensure construction machineries and trucks are well maintained. Use energy-efficient construction machineries and trucks during construction phase of the project.

Discharge of Wastewater, Sewage and Degradation of Water Quality	Construction of a communal septic tank linked to an approved wetland system. Promote recycling of wastewater especially storm water for dust suppression.
	Install meters in base camps to control and monitor consumption of water. Ensure regular maintenance of the plumbing system and septic tanks to avoid leakage or spillage of wastewater.
Storm water	Use of storm water management practices that slow peak runoff flow, reduce sediment load and increase infiltration. Use of vegetated swales, filter strips, terracing, check dams, detention ponds or basins, infiltration trenches and infiltration basins. Regular inspection and maintenance of permanent erosion and runoff control features. Paving in dry weather to prevent runoff of asphalt or cement materials.
Loss of Vegetation Cover and Biodiversity (94.5Ha of land from road reserve, borrow etc.)	Ensure separate EIAs are conducted for campsites, borrow pits and dams. Minimize clearing and disruption of riparian vegetation. Minimize removal of indigenous plant species and replant indigenous plant species in disturbed areas. Restoring the vegetative cover through properly designed afforestation and reforestation practices, whose success will be appreciated through vigilant monitoring and evaluation after planting.

Disturbance to Wildlife including hunting by project workers	Minimize clearance and disruption of riparian vegetation. Avoid critical terrestrial and aquatic habitats when siting roads and support facilities by utilizing existing transport corridors. Design and construct wildlife migration routes to avoid or minimize habitat fragmentation. Minimize removal of indigenous plant species, and replant indigenous plant species in disturbed areas. Explore opportunities for habitat enhancement through reduced clearance to conserve or restore native species.

Institutional Arrangements

The Ministry of Public Works (MPW) is responsible for the overall supervision and implementation of the ESMP through its project implementation unit. The PIU has two fulltime E&S staff including an Environmental Officer and a Social Safeguards Officer. The Environmental Protection Agency of Liberia (EPA) is the lead agency for environmental protection and management in Liberia. The EPA is mandated to enforce the Environmental Protection and Management Law 2002 (EPML). The EPA will issue an environmental permit prior to commencement of the rehabilitation works and monitor the project activities from time to time through field visits and review of quarterly environmental compliance reports submitted to it by the PIU.

Estimated Cost of ESM Implementation

The costs associated with implementing of mitigation and management measures in the ESMP have been estimated to the extent possible. For activities that have not been costed, the contractor is expected to estimate the cost of such activities and incorporate them in its overall bidding price of the work. The overall cost includes the cost of routine mitigation measures, itemised cost of project GRM implementation, cost of annual E&S audit, cost of annual renewal of project environmental permit. Cost associated with public consultations and awareness activities, capacity building for ESMP implementation and RAP monitoring

activities have also been included. The estimated cost of the ESMP, including the RAP is **Three Million Seven Hundred Forty-Six Thousand Three Hundred Thirty-Seven United States Dollars Ninety-Six Cents (US$**3,746,337.96**)** is required for the implementation of the RAP and the ESMP for both 11.5km and 50km. Of this amount, **Two Million One Hundred Eighty Thousand Five Hundred Eighty-One United States Dollars Seventy-Eight Cent (US$**2,180,581.78**)** will be paid directly to PAPs of both corridors under the Mano River Union Road Development and Transport Facilitation Programme (MRU/RDTFP) Phase-III: Paving of Keipo to Putuken (11.5km) to John Davis Town (50km) in River Gee and Grand Gedeh counties while the remaining **One Million Five Hundred Sixty-Five Thousand Seven Hundred Fifty-Six United States Dollars Eighteen Cent (US$1,565,756.18)** is intended for supervising the implementation of the GRM, SEP and ESMP.

Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) for the project has been developed to address all project related complaints including those that may arise from RAP implementation. It follows customary norms and fits into the statutory administrative process of the Government of Liberia. Grievance Redress Committees will be established and trained prior to the commencement of work. The grievance mechanism will be widely advertised to the stakeholders so that they are aware of the process, know they have the right to submit a grievance, and understand how the mechanism will work and how their grievance will be addressed.

To facilitate effective implementation of the project GRM, an itemised cost for implementation has been developed including the following activities/items:

(i) Communication and awareness raising on GRM
(ii) Establishment of GRM committees
(iii) Transport and communication cost associated with GRM operation
(iv) Training of various GRM committee members
(v) Cost for purchasing and operating equipment for GRM implementation

(vi) Cost of monitoring and reporting GRM activities

(vii) Cost associated with facilitating GRM committees works

The overall cost estimate for SEP/GRM implementation over 36 months period is **US$107,130**(One hundred Seven thousand One Hundred Thirty United States Dollars). This cost is also incorporated into the overall project ESMP implementation cost.

Public consultation during the preparation of the ESIA

Consultations were held with a wide range of stakeholders including community leaders, youth groups, woman groups, community base organizations, household heads, business owners, including market women, landlords, and structure owners. Local authorities and leaders from various administrative levels were also consulted as part of the preliminary phase of this project. As required by the EIA Procedural Guidelines of the EPA, consultations were conducted during the scoping stage of the ESIA as well as on the on the draft ESIA report. The objectives of these consultations were:

- Dissemination of information among potentially affected communities about the intended project;
- Getting perception of communities towards the project;
- Identification of anticipated project impacts on the socio-economic and cultural life of the community; and
- Identification of stakeholders and their roles in project activities.

Several concerns were raised during these stakeholder consultations. The main issues raised were about the following:

(i) **Employment Concerns**: Many participants raised concerns about giving local community members opportunity to work on the project. They expressed fear about "outsiders" coming to take available jobs. They were however assured that

local community members will be given opportunity to work despite the fact that people from other parts of the country will also be provided with employment opportunities. Participants were also informed about the project labour needs. The project will need skilled, semi-skilled and unskilled labour and that most of the skilled labour required to execute the project effectively may not be available locally and even nationally is some cases. So, there will always be the need to employ people outside of the project communities.

(ii) RAP related concerns: There were several concerns raised about RAP issues, including how payment will be done and when, and whether payment will be made before demolition of structures is undertaken. Clarifications were made about project requirements to pay all project affected people before the start of work and demolition exercise, and that those affected will be duly informed about payment well in advance, and agreement reached on how payment should be carried out before compensations are paid.

(iii) Road Safety and accidents emanating from speeding vehicles and construction machines: This was one of the main areas of concern for most the community members. Several concerns were raised about traffic management during the construction phase as well as the operation phase of the project. The participants were informed about measures in the project ESMP to manage traffic hazards during construction phase, including the institution and enforcement of speed limit as well as a mechanism in pace for community residents to report dangerous and reckless driving activities. For the operation phase, participants were informed about project s dedicated project component that supposed to address road safety issues.

(iv) Public Utilities: Restoration of public utilities (water and electricity) disrupted during the construction. The MPW expressed commitment to duly restore in timely manner public utilities that will be affected by the project.

Overall, despites all the concerns raised, there is overwhelming support for the project as its benefits clearly outweigh its potential negative environmental and social risks and impacts.

1 INTRODUCTION

1.1 Background

The Government of Liberia (GOL) has identified road infrastructure development as one of the key areas of its development agenda. It is believed that of the estimated 10,538Km of public roads in Liberia, only a minute portion about 7% (734 Km) are paved. In this regard, the Governments of Liberia has secured funding from the African Development Bank (AfDB) i.e., from the African Development Fund (ADF) and Transition Support Facility (TSF) to finance the Road Development and Transport Facilitation Programme in the Mano River Union Region (MRU/RDTFP) specifically towards the development of the 510Km road corridor between Ganta and Harper which links three (3) south-eastern counties (Grand Gedeh, River Gee, and Maryland counties) with an estimated population of one (1) million (25% of Liberia's population- LIGIS 2008 Censors). Also, the three (3) counties by extension linked Liberia to Ivory Coast via the Cavalla Customs in Maryland County which forms part of the Mano River Union Road Development and Transport Facilitation Programme as well as the Trans-African Highway. Using financing from the African Development Bank, the Harper to Karloken (50Km) and Harper Junction to Cavalla Custom (16Km) road corridors have been paved; while the Karloken to Fish Town (80Km) Road Corridor is ongoing with 86% progress made so far.

In continuation of the proposed 510Km road development from Ganta/Nimba County to Harper/Maryland County, the GOL requested the Bank (AfDB) for the construction of the road from Putuken to John Davis Town (50Km) in River Gee and Grand Gedeh counties. The road when paved, will not only make it adaptable to the adverse climatic conditions but also protect the current investment in addition to other socio-economic benefits associated with road improvement, greatly reduce the high cost of transportation and improve the living standards of our people. It aims at reducing travel time and vehicle operating cost by improving the road alignment and pavement condition. The road project

will also enhance the flow of regional and inter regional traffic and trade, and reduce road user costs, thereby strengthening regional economic integration. The road safety measures that would be put in place will enhance safety standards on the project road. In addition, the project will also facilitate easy access for farmers and traders to social services along the corridor expected to generate more income to augment the Government's effort in achieving economic development and poverty reduction.

1.2 The Environmental Impact Assessment

In accordance with Section 14 of the Environmental Protection and Management Law of the Republic of Liberia of 2002, the Republic of Liberia Environmental Protection Agency Environmental Impact Assessment Procedural Guidelines of 2017 and the AfDB's Safeguard Policies, the project's financing organization, the MPW is undertaking this ESIA for the rehabilitation of the Putuken – John Davis Town Road Corridor Road. Its main objective is to ensure that the potential impacts from the activities related to road rehabilitation and paving are identified, their significance is assessed, and appropriate mitigation measures are proposed to eliminate or minimize such impacts during a reasonable timeframe, taking into consideration the investment which has to be made.

This ESIA meets the following objectives:

- Ensure compliance with the local laws and regulations;
- Ensure compliance with the requirements of the funding agency;
- Determine the compatibility of the proposed project with the surrounding environment;
- Identify and assess environmental and social impacts, both adverse and beneficial in the project's area of influence;

- Manage potential adverse environmental and social impacts and risks on the surrounding population and environment by avoiding or at least minimizing them within acceptable limits;
- Assist decision makers in protecting, conserving and managing both the surrounding environment and the affected communities according to the principles of sustainable development;
- Incorporate environmental management plans and monitoring mechanisms during design and construction;
- Clarify the principles, obligations and generic measures for managing environmental and social risks and impacts during the exploitation and maintenance phase, as they will be reflected in the concession agreement;
- Ensure an opened and balanced process through public information and consultation, by promoting improved social and environmental performance of MPW.

1.3 The Purpose and Need for The Project

The proposed road rehabilitation is an important component in the revitalization of Liberia, a country rebuilding its infrastructure, rehabilitating its economy, attracting investment, and improving the livelihoods of its citizens following years of civil unrest and conflict. The Liberian government is developing strategies and policies to promote sustainable development and sound environmental management. The infrastructure constraints are the major impediments to economic recovery and growth in Liberia. One of the main challenges faced by the country is the limited road transport connectivity.

Adopting a sustainable road asset management strategy for creating durable transportation networks and ensuring their preservation is central to the sustainable development that the

GOL is endeavoring to promote and develop. Improvements made in the road and in the transportation, sector will be instrumental in:

- Improving inland connectivity to the inaccessible and deprived rural areas;
- Reducing transport and material costs by improving accessibility;
- Improving health and sanitation;
- Improving access to services;
- Enabling farmers to sell their goods and gain better prices, raising incomes
- Reducing poverty and hunger;
- Establishing employment, training, human resource development, and technology transfer opportunities;
- Increasing the earning potential;
- Enabling industrial and commercial growth; and
- Encouraging community and rural development.

This corridor is vital to the nation's reconstruction effort and the improvement of regional cross-border traffic, which will enhance Liberia's trade and interconnection with its neighbors: Ivory Coast, Guinea and Sierra Leone. The road has the potential to open up the south-east of Liberia and contribute to the delivery of government services such as health and education. The road will link the south-eastern counties to the planned dry port near Ganta.

2 LEGAL AND INSTITUTIONAL FRAMEWORK

This Chapter describes the applicable international standards and relevant Liberian regulatory framework that set the context within which the Project will operate.

2.1 National Legislative Framework

Table 1 describes the main categories of legislation in Liberia. Table 2 describes the relevant National Laws and Table 3 provide a summary of Liberian legislation, policies and strategies relevant to the project. Details from selected national legislation relevant to environment are described in Sections subsequent sections.

Table 2: Category of Legislations in Liberia

Category	Description
Law	Laws are passed by the National Legislature of Liberia comprising of the Senate and the House of Representatives. Any citizen or group of citizens, Cabinet Ministers, Managing Directors of public corporations or agencies can propose a bill to the National Legislature for enactment. The draft bill is first passed over to the appropriate Steering Committee of the Legislature. In case of environmental bill, this committee is generally the Committee on Natural Resources Energy and the Environment. The Committee reviews, assesses and presents the bill to the Legislative Plenary with appropriate amendments for debate, public hearing and subsequent enactment by the Legislature.
Executive Order	The Executive Branch of government headed by the President, is charged with the duty to either approve those bills or reject them. If the President signs a bill into law; it goes immediately into effect unless there is another effective date noted. Equally, the President can issue Executive Order without the approval of the National Legislature. The Executive orders have the power of a law provided that they do not contravene the existing law. The power of such orders has a limited time of existence.
Regulations	The national Legislature has empowered Cabinet Ministers and Managing Directors of public corporations and agencies to issue regulations for their respective functionaries without legislative approval or supervision, provided

	that such regulations are consistent with the statutory laws and the constitution of Liberia.

Table 3: Relevant National Law

Categories	Title	Year	Description
General	Constitution of the Republic of Liberia	1986	The 1986 Constitution is the main legal framework which provides for the rights, equal treatment, and protection of all Liberian citizens and those residing within the borders of Liberia. It ensures that no citizen is discriminated against on the basis of sex, age, ethnic background, religious belief, political affiliation, social and economic status.
Environment	The Environment Protection Agency (EPA) Act	2003	The Act provides the EPA with the authority of government for the protection and management of the environment in Liberia. It provides for an Environmental Administrative Court to hear from aggrieved parties and requires that an ESIA be carried out for all activities and projects likely to have an adverse impact on the environment.

Categories	Title	Year	Description
	The Environment Protection and Management Law (EPML)	2003	The law enables the EPA to protect the environment through the implementation of the Law. It arranges the rules, regulations, and procedures for the conduct of ESIAs and establishes regulations for environmental quality standards, pollution control and licensing, among others.
Forestry	Conservation of the Forests of the Republic of Liberia	1953	These Acts provided for the establishment of the Bureau of Forest Conservation within the Department of Agriculture and Commerce and described the basic legal framework for forest and wildlife management in Liberia.
	Supplementary Act for the Conservation of Forests	1957	

	The Act that created the Forestry Development Authority (FDA)	1976	These two acts established the FDA and defined its responsibilities, outlined forest offences and penalties, made provisions for an Advisory Conservation Committee and specified powers of forest officers with regard to trees in reserve areas. They gave the FDA the power to establish Government Forest Reserves, Native Authority Forest Reserves, Communal Forests and National Parks.
	Amendment to the FDA Act	1988	
	National Forestry Law	2000	This Act makes provision for the management and conservation of forest resources of Liberia, defines ownership rights and other rights in forests, provides for the protection of the environment and wildlife in forests, regulates the trade in forest products and provides for various other matters relative to forestry and wildlife.
	National New Forestry Reform Law	2006	This act amends the national forestry law of 2000 and the act creating the FDA. The administration of this Act provides for the FDA to exercise power under the law to ensure sustainable management of the Republic's forestland, conservation of the forest resources, and protection of the environment. It also has provisions for sustainable economic development with the participation of and for the benefit of all Liberians to contribute to poverty alleviation in the country.
	Act to Establish the Community Rights Law with respect to Forest Lands	2009	The law creates a legal framework that defines and supports community rights in the management and use of community and traditional lands and forest resources.
Biodiversity Conservation	Wildlife and national parks act	1988	The Act identifies a number of protected areas and specifies policies and objectives regarding wildlife and conservation in the country.
	Protected Forest Areas Network Law	2003	The Act for the Establishment of a Protected Forest Areas Network required a biologically representative network of protected areas to be established covering at least 30 percent of the

			existing forest area, comprising about 1.5 million hectares.
	FDA Draft Hunting Regulations	Undated	These regulations include a list of "Fully Protected Animals of Liberia".
	National Wildlife Conservation and Protected Areas Management Act	2014	The law updates the 1988 law on wildlife and national parks. It includes a number of important provisions relating to biodiversity and protected areas.
Occupational Health and Safety	Work Act of Liberia	2015	The recent Work Act repealed Title 18 of the Executive Law, Labor Practices of 1956. This is the most important piece of legislation on occupational health and safety in Liberia. Part VI of the Act provides the legal framework for occupational health and safety and outlines the general duties of employers and employees with respect to occupational health, safety and welfare in the workplace.
Categories	Title	Year	Description
Public Health and Safety	Public Health Law	1976	This Law provides a framework for the management of public health and health systems in Liberia. The 1976 Law is currently being updated in order to effectively govern the decentralized health sector and accommodate the changes that have taken place since its promulgation. For example, in 2010 a new chapter was added to the Law to manage HIV/AIDS.[1]

[1] Liberia Ministry of Health and Social Welfare. 2010. An Act to Amend the Public Health Law, Title 33, Liberian Code of Laws Revised (1976). Accessed from the GOL website: http://legislature.gov.lr/sites/default/files/Public%20Health.pdf

Land Rights	Aborigines Law	1956	The Act states that each tribe is entitled to the use of as much of the public land in the area inhabited by the tribe, as is required for farming and other enterprises essential to tribal necessities. It shall have the possession of such land as against any other person. It goes further to say that the omission of a tribe to have its territory so delimited shall not however, affect in any way its right to the use of the land. While this Act allows tribal people to own and use the land for living and productive activities, it does not allow the individuals or groups using the land to transfer the land to another user.
	Property law	1976	This law established the conditions under which a Liberian can own real property and dispose of. It states that one must hold title document for such land and when transferring same, it shall be done by title, duly registered. Land acquired under this law allows the owner to convey or transfer it to another person(s) or entity through legal process.
	Rules & Regulations Governing the Hinterland of Liberia (Revised)	2001	These rules are a successor to the earlier law and regulations on the hinterland. These rules apply not only to the hinterland, but also to land in other counties, under the customary land tenure system. Articles 66 and 67 of the rules grant tribal people in the rural area the right to utilize land in their locale. Any stranger wishing to utilize such land as against their usage shall compensate for the use of the land.
	Liberia Land Commission Act	2009	The objective of this act is to propose, advocate and coordinate reforms of land policy, laws and programs in Liberia. It does not have adjuratory or implementation role. The goal of the commission is "to develop comprehensive national land tenure and land use system that will provide equitable access to land and security of tenure so as to facilitate inclusive sustained growth and development, ensure peace and security and

			provide sustainable management of the environment".
	Land Right Act	2018	Drafted in 2014, this act was recently signed by the President of Liberia (19 September 2018). The act is part of the recent land reform process in Liberia. the objectives of this act are i) to define the different categories of land ownership and rights in Liberia; ii) to prescribe the means by which each of the categories of land may be acquired, used, transferred and otherwise managed; iii) to ensure that all communities, families, individuals and legal entities enjoy secure land rights and iv) to ensure equal access and equal protection with respect to land ownership, use and management, including ensuring that Customary Land is given protection equal to Private Land and that land ownership is permitted for all Liberians.

Table 4: Relevant National Policies, Strategies, Guidelines and Plan

Title	Year	Description
National Environmental Policy	2003	The policy provides a systematic and logical framework by which to address environmental issues. Section 4.7 of the policy calls for an ESIA on all major developmental, socioeconomic and land use activities in any form that may have adverse effects/impacts on the environment to one degree or another.
Environmental & Social Impact Assessment (ESIA) Procedural Guidelines	2017	The ESIA Procedural Guidelines provides administrative procedures for the preparation of ESIA to ensure effective environmental governance.

National Biodiversity Strategy and Action Plan	2004	The policy implements the United Nations (UN) Convention on Biological Diversity, of which Liberia is a member, on the national level.
National Forestry Policy	2006	The policy describes the main directions for the future of forestry development in Liberia, and updates earlier polices so they take into account the new Forestry Reform Law.
National Forest Management Strategy	2007	The strategy summarizes the FDA's approach to managing the national forest endowment. It includes objectives, goals, and management actions in pursuit of the overall aim to "conserve and sustainably manage all forest areas so that they will continue to produce a complete range of goods and services for the benefit of all Liberians and contribute to poverty alleviation in the nation" (FDA 2007, 4).
National Health Policy and National Health Plan[2]	2007	The document is a framework for health sector reforms in Liberia. The goal of the policy is to make health care delivery services throughout the country effective and efficient, thereby enhancing the quality of life of the population.
National Gender Policy	2009	The Policy is intended to eradicate and eliminate all gender related problems in Liberia.
Land Right Policy	2013	The policy provides recommendations for land rights in Liberia, centered on four basic types of rights: Public Land, Government Land, Customary Land and Private Land. The policy also fosters equal protection of all relative to all land matters. The policy recognizes that since the founding of Liberia, the lands of customary communities have been less secure than private lands. This must end such that land under customary practice and norms are given protection equal to that of private lands i.e. the land right of men and women.

[2] Liberia Ministry of Health and Social Welfare. 2007. National Health Policy and National Health Plan. Accessed from the ILO website: http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/--ilo_aids/documents/legaldocument/wcms_126728.pdf

2.1.1 Constitution of the Republic of Liberia

The 1986 Constitution is the main legal framework which provides for the rights, equal treatment, and protection of all Liberian citizens and those residing within the borders of Liberia. It ensures that no citizen is discriminated against on the basis of sex, age, ethnic background, religious belief, political affiliation, social and economic status.

Article 7 of the 1986 Constitution of the Republic of Liberia sets the fundamental basis for the constitutional, legislative, and institutional frameworks for the protection and management of the environment. It also encourages public participation in the protection and management of the environment and the natural resources in Liberia.

Article 8 of the Constitution states that the Republic shall direct its policy toward ensuring for all citizens, without discrimination, opportunities for employment and livelihood under just humane conditions, and towards promoting safety, health and welfare facilities in employment.

Article 22 (a) provides that every person shall have the right to own property alone as well as in association with others; provided that only Liberian citizens shall have the right to own real property within the Republic.

2.1.2 The Environmental Protection Agency Act

"An Act to establish a monitoring, coordinating and supervisory authority for the sustainable management of the environment in partnership with regulated Ministries and organizations and in a close and responsive relationship with the people of Liberia; and to provide high quality information and advice on the state of the environment and for matters connected therewith".

Thus, the Environment Protection Agency of Liberia (EPA) was created by the Act creating the Environment Protection Agency of the Republic of Liberia, known as the Environment Protection Agency Act. The Act was approved on November 26, 2002 and published on April 30, 2003. The establishment of the EPA marked a significant step forward in the protection and management of the environment of Liberia.

Section 5 of the Act designates the EPA as the principal Liberian authority for environmental management which shall co-ordinate, monitor, supervise, and consult with relevant stakeholders on all the activities for environmental protection and the sustainable use of natural resources. Section 6 (b) of the Act stipulates that the EPA should propose environmental policies and strategies to the Policy Council and ensure the integration of environmental concerns in the overall national planning. Moreover, the EPA is empowered to carry out, among other things, the following aspects of environmental protection and management in Liberia:

- Establish environmental criteria, guidelines, specifications, and standards for production processes and the sustainable use of natural resources for the health and welfare of the present generation, and in order to prevent environmental degradation
  for the welfare of the future generations;
- Identify projects, activities, and programs for which environmental impact assessment must be conducted under this Law
- Review and approve environmental impact statements (EIS) and environmental impact assessment (EIA) submitted in accordance with this Act;
- Monitor and assess projects, programs, and policies including activities being carried out by relevant ministries and bodies to ensure that the environment is not degraded by such activities and that environmental management objectives are adhered to and adequate early warning and monitoring on impending environmental emergencies is given;
- Review sectoral environmental laws and regulations and recommend for amendments and to initiate proposals for the enactment of environmental legislations in accordance with this Act or any other Act;

- Encourage the use of appropriate environmentally sound technologies and renewable sources of energy and natural resources;
- Function as the national clearinghouse for all activities relating to regional and international environment-related conventions, treaties and agreements, and as national liaison with the secretariat for all such regional and international instruments.

The specific requirements of this Act to the project are those prescribed in details in the EMPL and the EIA Procedural Guidelines. The ESIA has been developed in fulfillment of those requirements.

2.1.3 Act Adopting the Environment Protection and Management Law of the Republic of Liberia

The EPML is the principal piece of legislation covering environmental protection and management in Liberia in parallel to the EPA Act. The Act provides the legal framework for the sustainable development, management, and protection of the environment by the EPA in partnership with relevant ministries, autonomous agencies and organizations. It also stresses inter-sectoral coordination while allowing for sector specific statutes.

The Environment Protection and Management Law (EPML, 2003b) defines the specific requirements for performing an ESIA and other measures required to protect the environment in Liberia. Further details of the ESIA process are included in Section 2.3 of this chapter.

A summary of the key sections of the Environment Protection and Management Law are presented in Table 4.

Table 5: Key Section of the EPML

Section	Description
Section 6	Requires an ESIA license or permit for the commencement of projects that have the potential to impact the environment. An ESIA is required for some specific types of projects (defined in Annex I of the EPA Act), while the need for an ESIA for other projects may be determined on a case-bycase basis.

Section 12	Requires environmental review for projects or activities that may have significant impact on the environment. Project proponent shall submit to the EPA their plans for improving environmental performance, including: • Identification of the major environmental effects; • A comprehensive mitigation plan in accordance with Section 15 of this law.
Section 13	Requires the preparation of an environmental impact study.
Section 15	• Business investors should present an environmental mitigation plan to the EPA, which should include the following sections: • Objectives; • Description of activities to be carried out by the project to mitigate any adverse effects on the environment; • Period within which the mitigation measures shall be implemented; and • Proven effectiveness of the mitigation measures by indicating their experimental nature.
Section 24	The EPA should ensure that projects comply with their environmental mitigation plans through monitoring of their operations. Where evidence of non-compliance occurs, the EPA shall impose remedial measures and may bring action before the Environmental Court or through the Ministry of Justice to enforce compliance.
Section 25	The EPA is responsible for carrying out periodic environmental audits of activities or projects likely to have adverse effects on the environment.
Section 58	An "Effluent Discharge License" must be obtained from the EPA for any type of effluence discharge into the sewage system, also in case of operation of a sewage system. This license does not exceed one year.
Section 64	Requires project proponents to acquire a "Solid and Hazardous Waste Disposal License" in case of generation, storage, handling, transport or disposal of hazardous waste, or else ownership or operation of a waste disposal site. The EPA provides this license for a period of not more than one year. This license entails the party who is generating the waste to take up waste management measures such as treatment, determination or recycling and remediation.
Section 71	Requires a "Pollution Emission License" for any project or activity which is likely to pollute the environment in excess of any standards or guidelines issued under this Law (the EPML). The EPA provides this license for a period of not more than one year.

Section 74	The EPA may prescribe general or specific guidelines for the management of rivers, lakes or wetlands. Those of specific relevance to the project include: • Measures for the prevention or control of soil erosion; • The conservation of any vegetation growing in and around a river, lake or wetland; • The contingency plan for the prevention and control of any deliberate or accidental discharge which is likely to pollute the river, wetland or lake; and • The control measures to be taken in harvesting minerals including the strategies for the restoration of mining sites.
Section	**Description**
Section 75	Prohibits the activities below in relation with any river, lake or wetland declared as protected areas by the EPA. These activities include: • Using, erecting, constructing, placing, altering, extending, removing or demolishing any structure in, on, under, or over the bed; • Excavating, drilling, tunneling or disturbing the bed otherwise; • Introducing or planting any part of a plant, plant specimen or organism whether alien or indigenous, dead or alive in a river, lake or wetland; • Introducing any animal or microorganism whether alien or indigenous, dead or alive in a river, lake or wetland; • Depositing any substance in a river, lake, or wetland or in or under its bed, which is likely to have adverse environmental effects on the river, lake or wetland; • Directing or blocking a river, lake or wetland from its natural and normal course; and • Draining any river, lake or wetland.
Section 80	Provides an outline framework for the Protection of Wild Animals and Birds and includes conservation areas. It differentiates wildlife protected areas in section 80 (4) – national park, wildlife reserve, and nature reserve – from wildlife management areas in section 80 (5) – wildlife sanctuary, and community wildlife area – while also stating that the Line Ministry can designate any other area as either as it sees fit.
Sections 8385	Provide for the enabling environment for the conservation of biodiversity, charging the EPA with responsibility for a wide range of measures from preparing national conservation strategies to selecting and managing buffer zones to protected areas, to issuing guidelines for botanical gardens.
Section 91	The EPA may impose on the party that has caused or is likely to cause harm to the environment an "Environmental Restoration Order," requiring it to remedy/prevent the harm within 21 days of the service of the order.

Section 92	Allows the party to request the Agency to reconsider that order (Section 91) by giving reasons in writing within the same period.
Section 107	States that non-compliance with the restoration order convicts the responsible party to imprisonment and/or a fine.

On April 7, 2017, the EPA as required by the Environment Protection and Management Law of Liberia developed administrative procedures for the preparation of ESIA to ensure effective environmental governance. This process is applied prior to issuance of environment permits.

An EIA Process Flow Chart has been included as Figure 2. The main steps in the process are:

- Prepare Application for Environmental Impact License
- Prepare Notice of Intent (NOI)
- Submit Project Brief (allow 14 working days for EPA review and feedback)
- Conduct Scoping Process:
    1. Publish NOI in Media
    2. Prepare Terms of Reference (TOR)
    3. Conduct Meetings with EPA Environmental Committee and District Environmental Committees, as needed.
    4. Conduct Public Meetings with Potentially Affected Communities
    5. Submit Scoping Report to EPA
- Prepare Environmental Review
- Obtain EPA Approval of TOR and Environmental Review
- Prepare Environmental Impact Study and Report (included in EIA)
- Prepare Environmental Impact Statement (EIS) (included in EIA)
- Develop Comprehensive Environmental Mitigation Plan and Implementation Strategy (included in EIA)
- Agency Review of EIA (within 3 months)
- Public Consultation on EIA (within first 30 days of 3 months)
- Public Hearings (EPA to decide whether to hold these)

- Relevant Line Ministries Comment on EIA
- Review by EPA Environmental Assessment Committee
- Approval or Rejection by EPA (within 3 months of receiving EIA)

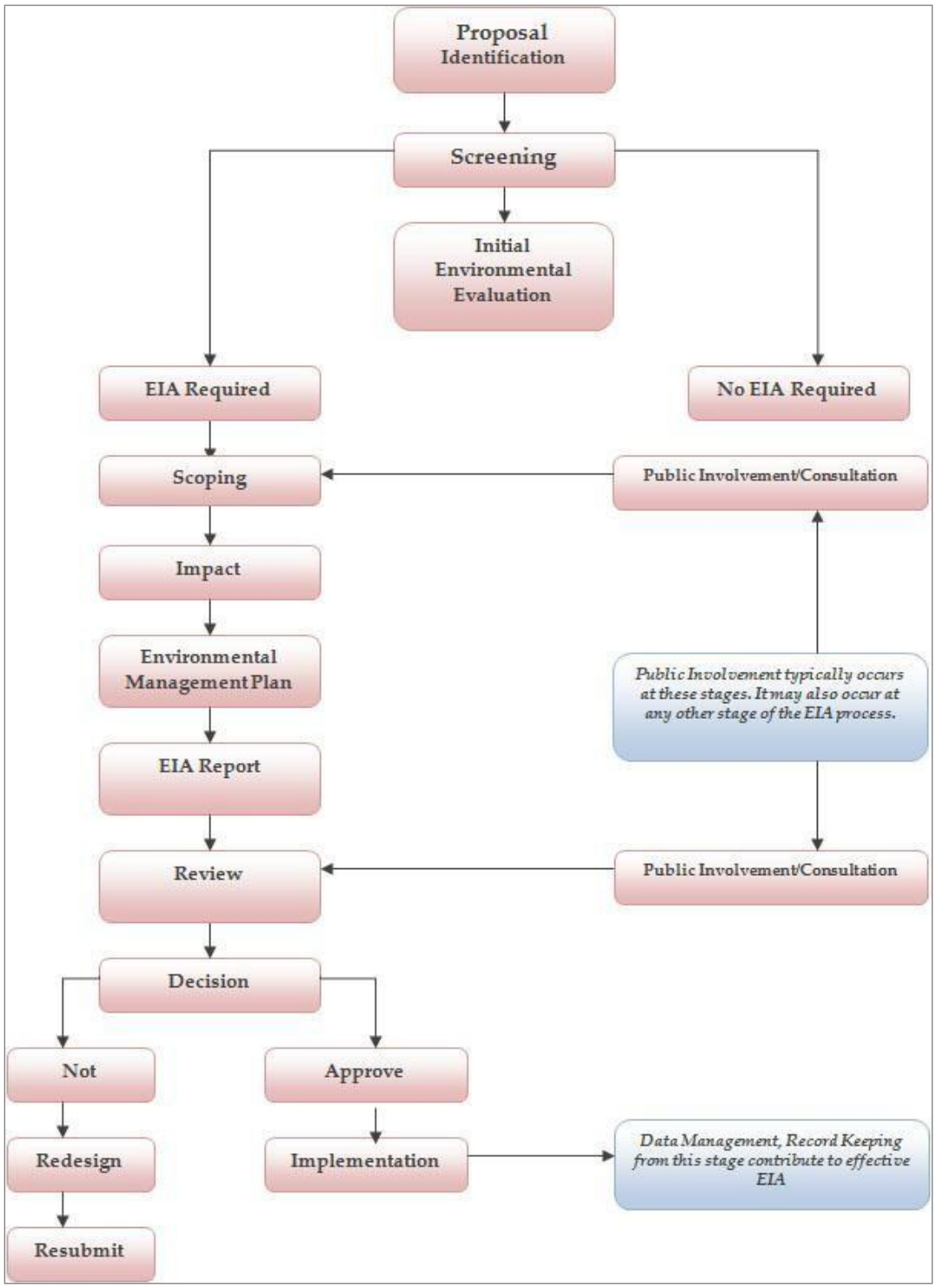

Figure 1: Liberia ESIA Process

The preparation of this ESIA satisfied all the requirements of the EPML and the EPA EIA Procedural Guidelines. First, the EPA was notified about the project through a letter on March 25, 2021. The project was subsequently issued a template for completing a project brief as required by the EPA for screening. The project brief was completed and submitted to the EPA on March 30, 2021. Following review of the project brief, the project proponent, the Ministry of Public Works, was request to conduct a full ESIA, starting with a scoping report. Scoping was conducted and public consultations carried as required. Preparation of the main ESIA was undertaken including the mandatory public consultations, and the report subsequently submitted to the EPA for review, public disclosure, and approval. The report was approved by the EPA on May 20, 2021. Project Environmental Permit is being process and will be issued prior to the commencement of work.

2.1.4 National Environmental and Occupational Health Policy

The Ministry of Health and Social Welfare has a Division of Environmental and Occupation Health; however, the Division lacks standards and policies specific to industries and/or occupational hazards. The National Environmental and Occupational Health Policy (NEOHP) was developed in 2007 to provide a framework for identifying policy needs and actions to improve occupational health and safety. It supplements the National Health Policy, which focuses on public health and health systems. The NEOHP identified the following key Environmental and occupational health needs:

1. Environmental sanitation
2. Food Safety Services
3. Water Quality and Safety
4. Vector Control & Chemical Safety
5. Waste Management
6. Disaster Management
7. Health Promotion

8. Occupational Health Services
9. Port Health
10. Pollution Control
11. Sanitary Engineering

There are no specific requirements that the project will need to fulfil in term of acquiring permits under this policy. Relevant aspects of the Policy, including water quality and safety and occupational health services will be followed by the Contractor. Appropriate specifications required by this policy will be included in the Employer's EHS specifications for works.

2.1.5 National Environmental Quality Standards

Several environmental quality standards are partly prepared by EPA. Some of these environmental quality standards that may be relevant for this project are: 1) Air Quality Standards; 2) Water Quality Standards; 3) Noise Level Standards; and 4) Waste Management Standards.

Air quality standards are not complete for ambient air. Existing ambient air quality Standards are given below in table 5.

Table 6: Existing Air Quality Standard Tolerance Limits (Environment Protection and Management Law- Air Quality & Standards Regulations, 2009

Pollutant	Time weighted Average	Industrial area	Residential, Rural & Other area	Controlled areas***
	Annual Average*	80 µg/m^3	60 µg/m^3	15 µg/m^3
	Annual Average		*0.019 ppm/50* µg/m^3	
	Month Average			
	24 hours**	120 µg/m^3	80 µg/m^3	30 µg/m^3
Sulphur oxides (SOx)	*24 Hours*		*0.048 ppm /125* µg/m3	
	One Hour			
	Instant Peak		*500* µg/m^3	

	Instant Peak (10 min)		*0.191 ppm*	
	Annual Average*	80 µg/m³	60 µg/m³	15 µg/m³
	24 hours**	120 µg/m³	80 µg/m³	30 µg/m³
	8 hours			
	Annual Average		*0.2 ppm*	
Oxides of Nitrogen (NOx)	*Month Average*		*0.3 ppm*	
	24 Hours		*0.4 ppm*	
	One Hour		*0.8 ppm*	
	Instant Peak		*1.4 ppm*	

Annual Average		*0.05 ppm*	
Month Average		*0.08 ppm*	

Nitrogen Dioxide	*24 Hours*		*0.1 ppm*	
	One Hour		*0.2 ppm*	
	Instant Peak		*0.5 ppm*	
	Annual Average*	360 µg/m³	140 µg/m³	70 µg/m³
	24 hours**	500 µg/m³	200 µg/m³	100 µg/m³
	Mg/Kg			
Suspended particulate matter (SPM)	Annual Average****			100 µg/m3
	24 hours***		180 µg/m³	
Suspended Particulate matter (<10 µg/m³) (RPM)	Annual Average*	120 µg/m³	60 µg/m³	50 µg/m³
	24 hours**	150 µg/m³	100 µg/m³	75 µg/m³
	Annual Average*	1.0 µg/m³	0.75 µg/m³	0.50 µg/m³
Lead (Pb)	24 hours**	1.5 µg/m³	1.00 µg/m³	0.75 µg/m³
	Month Average		2.5	

Carbon monoxide (CO)/ carbon dioxide (CO_2)	*8 hours***	*5.0 mg/m³*	*2.0 mg/m³*	*1.0 mg/m³*
	1 hour	*10.0 mg/m³*	*4.0 mg/m³*	*2.0 mg/m³*
Pollutant	Time weighted Average	Industrial area	Residential, Rural & Other area	Controlled areas***
Hydrocarbons (HC)	*24 hours***			
VOC	*24 hours***			
	1-Hour		*0.12 ppm*	
Ozone				
	Instant Peak		*1.25 ppm*	

* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.
** 24 hourly/8 hourly values should be met 98% of the time in a year. However, 2% of the time, it may exceed but not on two consecutive days. The 24-hour limit may not be exceeded more than three times in one year.
*** Not to be exceeded more than once per year average concentration
Whenever and wherever two consecutive values exceed the limit specified above for the respective category, it would be considered adequate reason to institute regular/continuous monitoring and further investigations.

Water quality standards are only completed for the marine waters. Drinking, domestic, industrial, agricultural and other types of water standards are still incomplete. However, the Ministry of Health Water Testing Laboratory uses the drinking water standards presented in table 6 below**Error! Reference source not found.**

Table 7: Liberia Drinking water Quality Standards (Ministry of Health and Social Welfare, 1987)

Parameter	Unit	WHO	Class I	Class II	Class III
pH	-logH	-	6.5 - 8.0	6.0 - 9.0	5.5 - 9.0
Chloride	mg Cl/l	350	≤ 250.0	≤ 350.0	≤ 450.0
Sulphate	mg SO_4/l	250	≤ 150.0	≤ 200.0	≤ 250.0
Hardness	$CaCO_3$ mg/l	100-500	≤ 190.0	≤ 300.0	≤ 600.0
Iron Total	Fe mg/l	0.1	≤ 0.1	≤ 1.5	≤ 2.0
Manganese	Mn mg/l	0.1	≤ 0.1	≤ 0.3	≤ 0.8
Zinc Total	Zn mg/l	5	≤ 1.0	≤ 2.0	≤ 5.0
Coliform Bacteria	n/ml	0	0	0	≤ 5
Bacteria Total	n/ml	0	0	≤ 10	≤ 50

Dissolved Substance	mg/l	500	≤ 500.0	≤ 1000.0	≤ 1200.0
Suspended Solids	mg/l	-	≤ 10.0	≤ 30.0	≤ 50.0
Ammonia	mg NH_4/l	0.5	≤ 1.0	≤ 3.0	≤ 6.0
Nitrate	mg NO_3/l	50	≤ 40.0	≤ 60.0	≤ 80.0
Nitrite	mg NO_2/l	-	≤ 0.1	≤ 0.5	≤ 1.0
Phosphate	mg PO_4/l	-	≤ 0.01	≤ 0.02	≤ 0.05
Phenols	mg/l	0.001	≤ 0.001	≤ 0.02	≤ 0.05
Detergents	mg/l	-	≤ 1.0	≤ 2.0	≤ 3.0
Fluoride	F mg/l	1.5	≤ 1.5	≤ 1.5	≤ 2.0
Cyanide	Cn mg/l	0.05	n.d.	≤ 0.02	≤ 0.05
Lead	Pb mg/l	0.1	≤ 0.1	≤ 0.1	≤ 0.1
Mercury	Hg mg/l	0.01	n.d.	≤ 0.005	≤ 0.01
Copper	Cu mg/l	0.05	≤ 0.01	≤ 0.01	≤ 0.2
Cadmium	Cd mg/l	0.01	n.d.	≤ 0.001	≤ 0.01
Chromium Trivalent	Cr mg/l	-	≤ 0.5	≤ 0.5	≤ 0.8
Chromium Hexavalent	Cr mg/l	0.05	≤ 0.05	≤ 0.1	≤ 0.1
Nickel	Ni mg/l	-	≤ 1.0	≤ 1.0	≤ 0.1
Silver	Ag mg/l	0.05	≤ 0.01	≤ 0.01	≤ 0.01
Vanadium	V mg/l	-	≤ 1.0	≤ 1.0	≤ 1.0
Boron	B mg/l	-	≤ 1.0	≤ 1.0	≤ 1.0
Arsenic	As mg/l	0.05	≤ 0.05	≤ 0.05	≤ 0.2

KEY

mg	milligram
L	Liter
ml	milliliter
n	count
n.d.	non detectable

Parameter	Unit	WHO	Class I	Class II	Class III

Water Classification Water can be used as

Class I	Drinking water for the population, Water Supply for industry requiring drinking water.

Class II For Fisheries, Cultivated fisheries, Organized public bath, Recreationnal water sports.

Class III	Industry supply except for industry requiring drinking water, irrigation or agricultural land.

Prepared for the Government of Liberia by UN Department of Technical Cooperation for UNDP New York 1987

Noise level standards are complete for many environments. Relevant noise standards are presented in Appendix of this report. Other noise standards and pollution control measures can be found in the Environment Protection and Management Law- Noise Pollution Control and Standards Regulations, 2017.

Table 8: Noise Pollution Control and Standards Regulations of 2017

Facility	Noise Limits dB (A) (Leq)	
	DAY	NIGHT
Any building used as hospital, convalescence home, home for the aged, sanatorium and institutes of higher learning, conference rooms, public library, environmental or recreational sites.	45	35
Residential buildings	50	35
Mixed residential (with some commercial and entertainment)	55	45
Residential + industry or small-scale production + commerce	60	50
Industrial	70	60
Time Frame: use duration *Day: 6.00 a.m. 10.00 p.m.* *Night: 10.00 p.m. 6.00 a.m.* *The time frame takes into consideration human activity*		

2.1.6 Gender Based Violence Policy in Liberia

Liberia has ratified or acceded to the core international human rights treaties. It is a party to the major regional human rights instrument which obliged states to respect, protect and fulfill human rights of all persons within the territory and subject to the jurisdiction of the state, without discrimination. As a state party to the Convention on the Elimination of All

Forms of Discrimination against Women (CEDAW) and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (the "Maputo Protocol"), Liberia has made legally binding commitments to exercise due diligence to combat gender-based violence and discrimination. Table 8 presents the legal and safeguard provisions that are in place to address this issue.

Table 9: Provision Related to GBV in Liberia

Category	Provisions
International Treaties	• The International Covenant on Civil and Political Rights (ICCPR) (2004); • the International Covenant on Economic, Social and Cultural Rights (ICESCR) (2004); • the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (CAT) (1993); • the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (1984); • the Convention on the Rights of the Child (CRC) (1990); • the Convention on the Rights of Persons with Disabilities (CRPD) (2012); and
	◇ the International Convention on the Elimination of All Forms of Racial Discrimination (1976).
Regional Treaties	• The African Charter on Human and Peoples' Rights (ACHPR) (1982); • the African Charter on the Rights and Welfare of the Child (ACRWC) (2007); and • the Protocol to the ACHPR on the Rights of Women in Africa (the "Maputo Protocol") (2007).

National Policies	• The National Action Plan for the Implementation of United Nations Security Council Resolution 1325 (2009); • the National Sexual and Reproductive Health Policy (2010), providing for access to quality health services for survivors of sexual violence and the establishment of a reporting mechanism to facilitate intra-governmental coordination in the management of SGBV cases[3]; • the National Plan of Action for the Prevention and Management of Gender Based Violence in Liberia (2011-2015); • the National Gender Policy (2012); • the Reconciliation Roadmap (2012), incorporating recommendations of the Truth and Reconciliation Commission to enhance women's psychosocial recovery and economic empowerment as a form of redress for sexual violence[4]; • the Agenda for Transformation (2012), which includes provisions to address gender-based violence and empower women in multiple sectors and to enhance the protection of children from violence and abuse[5]; • the National Human Rights Action Plan of Liberia (2013), which incorporates recommendations regarding SGBV received during the UPR process; and • the third Joint Program of the Government of Liberia and the United Nations on SGBV and harmful traditional practices, launched in 2016[6].

2.2 African Development Bank Environmental and Social Policy Requirements

African Development Bank Integrated Safeguards Requirements

The African Development Bank (AfDB) has established the **Integrated Safeguards System (ISS)** as a comprehensive environmental and social risk management framework to ensure that Bank-financed operations promote **inclusive growth, environmental sustainability, and social equity** across its Regional Member Countries.

The ISS is a cornerstone of the Bank's operational strategy and applies to all public and private sector projects financed by the AfDB. It is designed to:

- Identify and assess environmental and social risks and impacts at an early stage of project preparation;
- Avoid, minimize, mitigate, or compensate for adverse impacts;
- Strengthen borrower capacity for environmental and social management;

[3] Ministry of Health and Social Welfare, National Sexual and Reproductive Health Policy, at 9 (2010).

[4] Republic of Liberia, towards a Reconciled, Peaceful, and Prosperous Liberia: A Strategic Roadmap for National Healing, Peacebuilding, and Reconciliation 2012-2030 (2012) [commonly referred to as the "Reconciliation Roadmap"].

[5] Ministry of Planning and Economic Affairs, Agenda for Transformation: Steps Toward Liberia RISING 2030, at 119-22 (2012). [6] This Programme has a budget of US$36 million to implement its mandate of preventing and responding to SGBV from 2016 to 2020.

- Promote transparency, accountability, and stakeholder participation; and
- Enhance long-term project sustainability and development effectiveness.

Safeguards serve as a preventive and corrective tool. By systematically identifying risks—such as involuntary resettlement, biodiversity loss, community health and safety risks, labor issues, and climate vulnerability—the ISS reduces potential project delays, reputational risks, and financial costs. Ultimately, it ensures that affected communities are protected and that environmental resources are sustainably managed.

Operational Safeguards under the ISS

The AfDB ISS comprises ten (10) Operational Safeguards (OS), which collectively address environmental and social risk management across the project lifecycle. These safeguards cover issues such as:

1. Environmental and Social Assessment
2. Involuntary Resettlement
3. Biodiversity and Ecosystem Services
4. Pollution Prevention and Resource Efficiency
5. Labor and Working Conditions
6. Community Health, Safety, and Security
7. Vulnerable Groups and Gender
8. Cultural Heritage
9. Climate Change Risk Management
10. Stakeholder Engagement and Information Disclosure

Based on the scope, scale, geographic footprint, and anticipated impacts of the project, **all ten (10) Operational Safeguards have been triggered**. This reflects the project's complexity and the range of environmental and social sensitivities associated with its implementation, including land acquisition, livelihood impacts, biodiversity considerations, occupational health and safety risks, and community engagement requirements.

Project Categorization under the ISS

In accordance with the ISS classification criteria, the project has been categorized as **Category 1**.

Category 1 projects are those likely to result in:

- Significant adverse environmental and/or social impacts;
- Impacts that are irreversible or unprecedented;
- Impacts that may affect broad areas beyond the immediate project footprint; or
- Significant cumulative or induced impacts.

Category 1 classification requires the highest level of environmental and social due diligence.

This categorization is consistent with national environmental legislation, which mandates a **full Environmental and Social Impact Assessment (ESIA)** for projects of this nature and scale. The national requirements align with AfDB standards in requiring comprehensive assessment, mitigation planning, stakeholder consultations, and public disclosure.

Required Safeguard Instruments

Given the Category 1 classification and the triggering of all ten Operational Safeguards, the following safeguard instruments have been prepared:

1. Full Environmental and Social Impact Assessment (ESIA)

The ESIA provides:

- A detailed description of the project and alternatives considered;
- Baseline environmental and social conditions;
- Identification and evaluation of potential impacts (direct, indirect, cumulative, and induced);
- Climate risk and vulnerability assessment;
- Stakeholder engagement documentation; and
- Proposed mitigation and enhancement measures.

The ESIA serves as the principal environmental and social due diligence document for the project.

2. Stand-Alone Environmental and Social Management Plan (ESMP)

A comprehensive and stand-alone **Environmental and Social Management Plan (ESMP)** has been developed in accordance with AfDB requirements. The ESMP:

- Translates mitigation measures identified in the ESIA into actionable commitments;
- Defines roles and responsibilities for implementation;
- Provides monitoring indicators and reporting arrangements;
- Includes capacity-building measures;
- Establishes cost estimates and budget provisions; and
- Integrates contractor obligations into bidding and contractual documents.

The ESMP ensures that mitigation measures are not merely conceptual but operationalized throughout construction and operation phases.

3. Resettlement Action Plan (RAP)

In line with the Operational Safeguard on Involuntary Resettlement, a full **Resettlement Action Plan (RAP)** has been prepared. The RAP includes:

- Socioeconomic census and asset inventory of Project Affected Persons (PAPs);
- Valuation methodology and compensation framework;
- Livelihood restoration measures;

- Vulnerable group assistance measures;
- Grievance Redress Mechanism (GRM);
- Institutional arrangements;
- Implementation schedule; and
- Budget and financing plan.

The RAP ensures that affected persons are compensated at full replacement cost and that their livelihoods are restored or improved relative to pre-project conditions.

Disclosure Requirements

Transparency and stakeholder participation are central principles of the AfDB ISS.
To comply with the Bank's disclosure policy:

- The ESIA, ESMP, and RAP must be disclosed **both in-country and on the AfDB's official website**.
- Disclosure must occur **at least 120 days prior to the project's consideration by the AfDB Board of Directors** for Category 1 projects.
- In-country disclosure shall include making documents accessible at relevant government institutions, local administrative offices, and other public locations accessible to affected communities.
- Summaries may be translated into local languages where necessary to ensure meaningful consultation and informed participation.

The 120-day disclosure period allows sufficient time for public review, feedback, and incorporation of stakeholder concerns before final project approval.

The AfDB Integrated Safeguards System establishes a robust framework for managing environmental and social risks in development projects. The triggering of all ten Operational Safeguards and the Category 1 classification underscore the significance and complexity of the project.
Through the preparation of a full ESIA, a stand-alone ESMP, and a comprehensive RAP—along with strict adherence to disclosure and consultation requirements—the project aligns with AfDB standards and national environmental legislation. These measures collectively ensure that the project contributes to sustainable development, protects affected communities, and safeguards environmental integrity throughout its lifecycle.

The project has been Categorized as Category 1 under the ISS. This is also in line with the national environmental impact assessment requirements which requires a full ESIA for this project. Based on the project category, the Bank requires a full environmental and social

impact assessment to be conducted. A stand-alone Environmental and Social Management Plan (ESMP) is also required. The project has developed this ESIA and a stand-alone ESMP in fulfilment of these requirements. A full Resettlement Action Plan (FRAP) has been developed as required. These documents need to be disclosed both in country and on the Bank's website. To satisfy the disclosure requirements of the ISS, the Environmental and Social Assessment reports (ESIA, ESMP, and RAP) will need to be disclosed 120 days before the Board date of the project.

2.3 Environmental and Social Institutional Framework

The environmental and social governance in Liberia is divided between the EPA and some other ministries and national authorities, on the national level, and the Environmental and Social Committees, on the local level.

2.3.1 National Level

The Environmental Protection Agency (EPA) of Liberia is the main agency and principal authority in Liberia for environmental management. In addition to the EPA, other organizations involved in environmental protection and management include the Ministry of Lands, Mines and Energy (MLME), the Ministry of Agriculture (MPW), the Forestry Development Authority (FDA). Organizations involved in social protection and management include the Ministry of Gender, Children and Social Protection (MGCSP), the Ministry of Justice and the Ministry of Labor.

Table 9 summarizes the key functions of the EPA and other institutions relevant to environmental and social governance in the country.

Table 10: Key function of the National Institution Governing Environmental and Social Issues

Institution	Key Functions

Environmental Protection Agency (EPA)	• to "*coordinate, monitor, supervise and consult with relevant stakeholders on all activities in the protection of the environment and sustainable use of natural resources*" (GoL, 2003a, s. 5); • has executive authority for all environmental activities and programs relating to environmental management in Liberia (GoL, 2003a, s. 5); • responsible for issuing environmental impact assessment licenses and • responsible for compliance monitoring relating to environmental regulations and standards.
Ministry of Lands, Mines and Energy (MLME)	• responsible for the development of mineral, water and energy resources in Liberia; • in charge of land surveys; • coordinates, administers and regulates the use of public and private lands in Liberia, including mineral resources through granting of operation licenses, and regulates beach sand mining; • conducts training and research on land rehabilitation together with the Ministry of Agriculture and the University of Liberia; • manages the energy provision through the National Energy Committee; and • manages water resources through the Liberian Hydrological Services.
Ministry of Agriculture (MPW)	• regulates forestry in relation to plant quarantine, agro-forestry and food crop related plantations, fishery and agriculture sectors; • has specific responsibilities for soil conservation; and • plans, executes, administers, manages and supervises agriculture programs and provides extension services, trains local farmers in improved cultural practices, and supplies farm inputs to enhance food security.

Forestry Development Authority (FDA)	• is responsible for the protection, management and conservation of government-owned forests and wildlife on a sustainable basis; • manages commercial, conservation and community use of Liberia's forest estate; • provides long- and mid-range planning in the forestry sector; • prepares forestry policy, law and administration; • controls the commercial use of state-owned forests: grants the concessions, supervises the adherence to the forest legislation and the concession agreements, calculates and determines forestry fees, evaluates investment proposals, executes reforestation and forest research and training and monitors activities of timber companies; and • is responsible for the development and management of protected areas and wildlife through the Department of Conservation which is made up of the Division of National Parks and the Division of Wildlife
Ministry of Gender, Children and Social Protection (MGCSP)	• serves as the main Central Government institution for promoting gender equality and the elimination of all forms of discrimination against women and girls. • Through its National Gender Policy and National Gender Action Plan, the Ministry seeks to ensure gender equality across the spectrum of the social, economic, political and cultural life of the nation. • has a Sexual and Gender Based Violence Unit (SGBVU) mandated to monitor and report on cases of Sexual and Gender Based Violence (SGBV) throughout the country.
Institution	Key Functions

The Ministry of Justice Sexual and Gender Based Violence Unit (SGBVCU)	• shares information with the Ministry of Justice to recommend cases for prosecution. • serves as the secretariat for the Gender-Based Violence InterAgency Task Force, which brings together UN, government, and local and international NGOs to address pressing gender-based violence issues in the country • oversees the prosecution of sexual offenses at Criminal Court "E" and at the regional justice and security hubs. The Ministry of Justice has assigned trained SGBV prosecutors in eight counties including Nimba, located in Sanniquellie.
The Ministry of Labor	• is the central government institution established to advance safe, fair and harmonious workplace practices that are essential to the social and economic wellbeing of citizens and residents. • is responsible to set, communicate and enforce workplace standards. • develops, coordinate and implement strategies to prevent workplace injuries and illnesses through training and dissemination of health and safety information

☐ Local Level

☑ County and District Environmental and Social Committees

To decentralize environmental management, the Environmental Protection Agency Act authorizes the establishment of County and District Environmental Committees and directs the National Environmental Policy Council to provide guidelines for their establishment. Each County Committee is composed of county and district officials, traditional leaders, private citizens, and two local representatives to the national legislature. The Committee is staffed by a County Environment Officer, hired by the EPA, but responsible to the County Committee.

The District Environment Committees are to be established by and report to the relevant County Environment Committee. They are charged with promoting environmental awareness and mobilizing the public to manage and monitor activities within the district to ensure that they do not have any significant impact on the environment. The District Committees are composed of district officials, mayors, chiefs, and private citizens and are staffed by a District Environment Officer hired by the EPA.

In addition to assisting the County and District Committees in the fulfillment of their responsibilities, the County and District Environment Officers are responsible for compiling reports to the EPA, promoting environmental awareness, and conducting public hearings on environmental impact assessment in the County and the District.

At present, two County Environmental Committees have been established; One in Sinoe County and another in Nimba County. However, EPA has established outstation offices in eight counties. The offices are staffed by Environmental Inspectors. As the County Environment Committees are established, some of the Inspectors may be reassigned as County Environment Officers.

☐ Environmental Inspectors and Courts

To provide for enforcement of environmental requirements and standards, the Environmental Protection Agency Act provides for the appointment of Environmental Inspectors and the establishment of an Environmental Court system.

☐ Environmental Inspectors

The EPA Act authorizes the EPA to "designate its officers and duly qualified public officers/civil servants … to be environmental inspectors within such Counties and District limits." Thus, Environmental Inspectors do not have to be EPA employees, but can also be designated officers or civil servants in other branches of the government. Environmental Inspectors are authorized to enter premises, inspect activities, take samples, and review records to ensure compliance with environmental rules and regulations. The exact nature of the inspector's enforcement authority is not defined in the Act, but the Act does state that the EPA is to "…establish the conditions, rules and regulations governing the qualifications, performance, powers and duties of the Environmental Inspectors." The EPML confirms that Environmental Inspectors can write Restoration Orders to correct an activity deemed to be noncompliant with environmental rules and regulations. Currently, the EPA has inspectors deployed in all the counties and districts of Liberia.

- Environmental Courts

The Environmental Protection Agency Act defines a two-tiered court system to hear and rule on compliance with environmental rules and regulations. The first tier is the Environmental Administrative Court. This court is to hear and rule on complaints relating to the environment. The complaints may concern the actions or decisions of the EPA or an Environmental Inspector or may be brought by a member of the public to stop activities they believe are damaging the environment. The second tier is an Environmental Appeals Court, established at the Judicial Circuit level. At present, the Environmental Court system has not been formally established.

3 PROJECT DESCRIPTION

3.1 Project Development Objective

The overall objective of the third Phase of the Programme (as was the case with the ongoing two phases) is to boost the post-conflict economic recovery of the three countries in the MRU region by improving road infrastructure and promoting intra-community and regional trade. Specifically, the Programme seeks to improve transport conditions on the two road sections and bridge in order to reduce transport costs, facilitate the free movement of persons and goods between the two countries and improve the living conditions and wellbeing of programme area communities.

The expected outcomes include: (a) reduced transport costs and travel time; (b) enhanced potential for agriculture thereby contributing to food security and alleviating poverty among communities on the corridors; (c) improved road safety and social wellbeing and (d) improved regional trade and integration.

3.2 Project Components

The project has three components including (i) Road development and mitigation of negative environmental impacts, (ii) Social Infrastructure and Institutional support measures (iii) Transport and Trade facilitation as provided, and (iv) Programme management. Details of each component are provided in the Table 11 below.

Table 11: Indicative Project Component

Components	Description of Components	Indicative cost (M UAC)

Road development and mitigation of negative environmental impacts	*Road works and ESMP*: • Construction of a total 118 km section of road (Fish Town – Zwedru: A total of 118 km gravel road to be upgraded to asphaltic concrete) and (ESMP); • Implementation of RAPs; and • Civil Works control and Supervision of roadworks including knowledge transfer activities	80.37
Social Infrastructure and Institutional support measures	*Social Infrastructure and Institutional support Measures* • Construction of 1 roadside markets, 1 clinic, 3 separated toilets and 3 boreholes along the Fish Town Zwedru road section (to be confirmed at appraisal time) • Communities/Workers Sensitized on HIV/AIDS, Malaria, Gender Empowerment, Sexual and Reproductive Health Rights (SRHR) and Road Safety. • Support with Environmental, Social and Gender safeguards • Support to gender unit at the Ministry of Public Works • Training of graduate engineers	1.16
Transport and Trade facilitation	*Transport and Trade Facilitation*: • Design and Need Assessment Study for Trade Facilitation including examination of Border Procedures and Processes along the Voinjama (Liberia)– Medikoma (Liberia/Sierra Leone border) corridor • Feasibility Studies and Detailed Design for the Voinjama (Liberia)– Medikoma (Liberia/Sierra Leone border) road (80km) • Empowerment and Capacity building farmers and SMEs (including WSMEs) to better engage trade activities • Support to regional coordination of the Transport Facilitation Component	1.88

Programme management	*Programme Management and Consultancies*: • Socio-economic impact monitoring and evaluation (M&E) of the Programme; • Financial and accounting audit of the programme; • Technical and Road Safety Audit of the Programme • Material and logistical support to the Programme executing agency (EA	1.53

3.3 Project Site

The rehabilitation, improvement and maintenance of the Putuken – John Davis Town Road (''the

Project'') is a component of the Mano River Union Road Development and Transport Facilitation Programme. The existing laterite road is a primary two-lane highway, which traverses mostly rural communities and is located between River Gee and Grand Gedeh counties and extends over a length of 50 Km between the towns of Putuken and John Davis Town. The entire Putuken to John Davis Town corridor is unpaved and has been engineered to good riding comfort due to regular maintenance work by MPW although some parts of the road remained in a very deplorable condition and inaccessible mostly during the rainy season. The carriageway is narrow due to overgrown vegetation. The project road has about three major junctions: Jedepo Junction/Combat Gate near Kilepo, Putu Pennokon Junction/Sapo Check Point, and CVI Junction, John Davis Town. Major towns on the project road include, Putuken, Kilepo, Putu Pennokon, Boley Town, Farley Town, Gbejolobo Town, Petrokon or Tiama Town, Panrrow Town and John Davis Town. Road passing through these towns is unprotected by drains to carry runoff from the carriageway. The horizontal and vertical alignments mostly follow the existing rolling terrain with occasional steep vertical grades within the corridor. The elevation at site varies between 35 and 300 meters above sea level. Approximately there are about 22 towns and villages along the proposed corridor and 31

streams/creeks that would require culverts installation in line with the design specification. The project road section has lane configuration from single lane to two lanes. The proposed road comprised of one existing bridge (the Nougbey River's Bridge).

3.4 Project Beneficiaries

The project beneficiaries will include residents living along the Putuken – John Davis Town Road Corridor (50Km) as well as road transport users from all over Liberia and the neighboring countries. This includes households in towns and cities connected to the road and transport service providers, who will see substantial cost reductions and improved travel time. During the construction phase, the local residents will benefit from employment opportunities for both skilled and unskilled workers

The immediate effect of the road on the transport sector will be in several areas, including an increase in traffic volume, changes in modal mix and freight composition, a reduction of transport costs, and an increase in seasonal variations of traffic.

These travel and transport changes will ease access and improve mobility for accessing social and economic services and facilities. It is expected that there will be a wider development impact on the local economy. Furthermore, the above impacts will affect the households living along the road corridors to varying degrees. Ultimately, the project will improve household welfare and reduce poverty.

3.5 Project Location

The project is located in River Gee and Grand Gedeh Counties. The corridor lies between Putuken and John Davis town that make up the 50 km. The African Development Bank (AfDB)

is expected to provide funding to upgrade this road from graveled surface to asphalt pavement. The work will generally consist of clearing of topsoil, earthworks and excavation of longitudinal ditches, construction of culverts and bridge, pavement construction, erosion control measures, drainage improvement, safety improvements including reflectorized paved markers, sidewalks in town sections and other necessary location where possible, curb, gutter through urban areas and other ancillary works.

MPW/PIU
2021

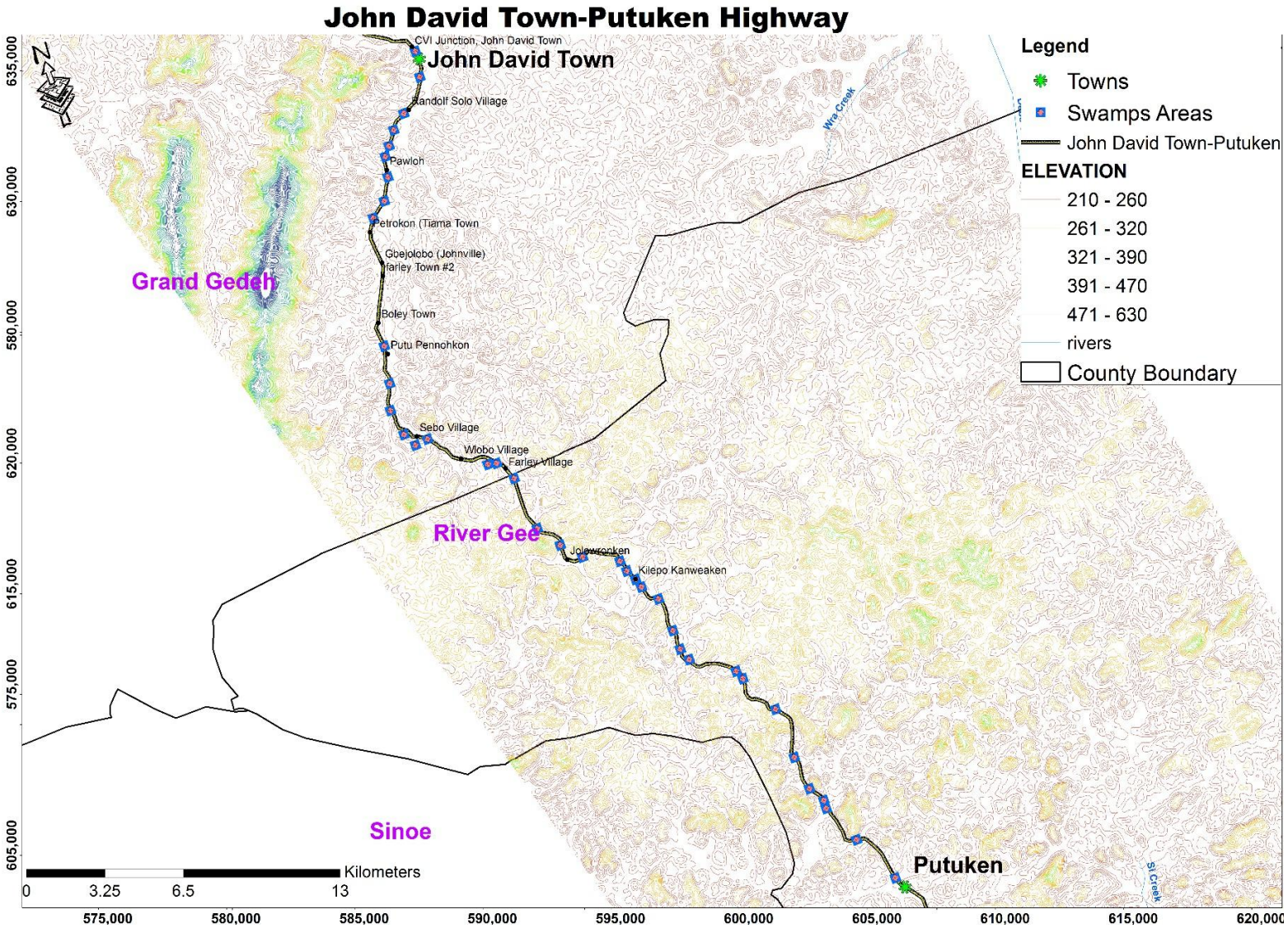

Figure 2: Project Location Map 50

3.5.1 Existing Road Conditions

The existing road connecting Putuken – John Davis Town Road Corridor (50Km) is mostly a gravel single carriageway approximately 6-meter width. Short sections within some of the villages are gravel surfaced. The surface condition of the road varies by section but is poor overall and extremely difficult to transit during the rainy season. Most of the gravel material has been eroded, exposing the weak underlying subgrade which gives rise to impassable sections for most vehicles during the rainy season.

With limited funding for maintenance, the immediate response has largely consisted of the removal of unsuitable material and grading activities in critical zones. Over the years, this has led to significant sections dropping below the original ground level, which entrenches the cycle of ponding on the carriageway and significant rutting under truck loads and further deterioration of the road. Typical conditions during the rainy season are shown in the below pictures.

The road edges are overgrown with vegetation and functional side drains are limited. Several towns have concrete U-drains on both sides of the road, but these drains are mostly blocked and in a state of disrepair. Culverts for cross drainage are generally difficult to find, being hidden

by dense vegetation. The road crosses several swampy areas. Some culverts, where visible, have been blocked, creating flooded areas upstream of the road, which are liable to overtopping during the rainy season.

There is one bridge (Nougbeh River Bridge) along the road and many smaller streams. The bridge is a concrete beam which is to be rehabilitated during the project implementation. There are no signs of excessive damming or overtopping at the bridge locations. Continuous grading of the road has lowered many of the approaches to bridges to a level below the deck.

Figure 3: Current Road Condition

Figure 4: Nougbeh River Bridge in Grand Gedeh County

3.6 Project Infrastructures and Activities

3.6.1 Project Infrastructure

- Right of Way (RoW)

It is intended that the road routing and design will follow the existing RoW set by the Ministry of Public Works (MPW). However, in urban areas, the road reserve will be reduced from 22.8 to 15.2 metres (i.e., 75 to 50 feet) from either side of the road centerline. The reduction in the Right of Way in urban areas is done to reduce project impacts on assets that are within the standard 45.7-metre (i.e., 150-foot) legal RoW. In rural areas, the RoW will remain 22.8 metres (i.e., 75 feet) on either side of the road centerline. In both rural and urban areas, the RoW includes drainage and other roadside structures. Realignment of the RoW will be minimized as much as possible. It is expected that there will be no major road realignment except where it is extremely necessary. In practice this would only take place in locations where it is necessary to improve the safety of poor sections of horizontal or vertical alignment, or where a new bridge or culvert has to be located off the existing alignment for constructability reasons.
If there are realignments, the impacts will be assessed and the RAP will be updated.

The extent of clearance of forest trees – native, naturally growing trees rather than planted crop trees such as rubber – is not yet determined. This is because there has not yet been a detailed tree survey of the road right of way in connection with the final design for the upgraded road, and because the locations of land take for ancillary infrastructure (i.e., camps, quarries, borrow areas, etc.) are not yet known. Forest trees might need to be cut down for a number of reasons: (a) to clear areas in the right of way that have never been cleared before, but now require it for the upgrading of the road; (b) to clear land for ancillary infrastructure, as described below; and (c) to clear land for access tracks to ancillary infrastructure. This matter is particularly addressed in the biological baseline in the chapters

covering impact assessment and mitigation (chapters 6 and7), as whereas the and in the Environmental and Social Management Plan).

- ☐ Diversions

During construction, diversions may be required. These diversions will ideally remain within the RoW. In sections where this will not be possible, traffic will be diverted temporarily across private land. In such cases, impacts will be evaluated and mitigation measures and the RAP will be updated. For the purposes of the ESIA, and with the implementing contractor not been selected, it is assumed that diversions will be needed along the entire road length for certain periods. In rural areas these must be within the right of way except where culverts are being reconstructed or steep terrain requires a wider deviation; in these cases, there will be additional measures in the RAP. In urban areas, diversions may be required around back roads, for which cases a range of impacts and consequent mitigation measures are identified as necessary and covered in the ESMP. The key stipulation for all diversions is the need to manage them carefully, for short durations only. Access roads shall be provided especially in towns or farms section for road users and for either heavy equipment or other vehicles to travel. The contractor shall provide access road planned, which will have a maximum

- ☐ Quarries and Borrow Pits

Quarries and borrow pits will be needed to provide the necessary materials for the construction works. Information on the numbers, designs and exact locations of these features is not yet available. Consequently, the ESIA estimates that there will be at least two quarries for the crushed stone and sand required in construction, and several borrow pits to obtain the gravels and engineering fills required in the road formation. It is possible that existing quarries could be used, but it is most likely that new quarries will be required. These will involve the creation of access, clearance of vegetation and soils, construction of working areas and storage facilities, drilling, blasting and crushing of rock, and the transportation of the products to the construction sites. All of these can have significant environmental impacts, and so the ESIA incorporates the likely impacts based on experience

from other projects, and gives detailed guidance on the obligatory mitigation measures that must be followed during the siting, operation and subsequent rehabilitation of quarry sites. Borrow pits do not have such big impacts individually, but are more numerous. The impacts and mitigation measures for the siting, use and closure of these facilities are

- Concrete Batching Plants and Hot Mixing Plants

Concrete batching and asphalt hot mixing plants will be needed to support the construction works. Again, information is not yet available on the numbers, designs and exact locations of these facilities. The selected project implementation contractor will require asphalt and concrete batching plants. Poorly sited or managed, they can create significant environmental impacts. For this reason, the ESMP incorporates the likely impacts based on experience from other projects, and gives detailed guidance on the obligatory mitigation measures that must be followed during the siting, operation and closure of the plants.

- Storage Areas, Parking Lots and Workshops

The contractor will need to create areas for the storage and management of equipment (heavy machinery, vehicles, engines, etc.) as well as materials (paving material, lubricants, fuel, chemicals, etc.), explosives and solid waste. As with the other ancillary facilities, information on the number, design and exact locations of these areas is not yet available because the contractor has not been selected and there are no other established locations for these activities that can be designated on the road section. Pollution can be a significant problem where machines, fuels and lubricants are involved, and so special measures are essential to ensure that the environment and society are properly protected. The ESIA uses experience from other projects to identify the likely impacts and determine the mitigation measures that must be used to ensure that these facilities are safeguarded.

- Camp Sites

As with the other ancillary facilities, the construction of temporary camps will be required to accommodate the project employees and provide offices for the management and administrative staff. Again, information on the number, design and exact locations of these

areas is not yet available because the contractor has not yet been selected and there are no clearly definable locations. Apart from the risk of pollution, residential and work camps can have significant positive and negative impacts on the socio-economic activities of the nearby surroundings, through the introduction of alien infectious diseases and increases in cost of local commodities due to influx of money from the contractor's workers. For this reason, the ESIA provides the necessary guidelines for the siting, operating, and closing of camps, to ensure that the potential positive impacts are enhanced, and the negative impacts mitigated.

- Project Activities

The project activities will consist of a range of operations that are aimed at ensuring that the rehabilitation of the Putuken - John Davis Town Road Corridor (50Km) will be completed on time and will be operational and maintained as required. The main activities will occur in three different phases: Design Phase, Construction Phase, and Operation Phase.

The construction Phase has been perceived to have adverse impact on the environment. It will entail the pavement and rehabilitation of bridges, and installation of the drainage system, temporary camps, quarries, borrow pits, mixing and matching plants takes place. Activities can be described as follows:

1. Establishment, supply and construction of offices and residential premises, and provision of supplies.
2. Procurement and mobilization of equipment, vehicles, and software.
3. Vegetation clearing along the RoW;
4. Earthworks: strengthening and widening of the embankment or cut formations.
5. Establishment of borrow pits and quarries,
6. Installation of crushers, hot mix plants, concrete batching, and wash plants.
7. Construction and installation of culverts and drainage works.
8. Construction of the asphalt carriageway and shoulders.
9. Construction and rehabilitation of bridges: reinforcing concrete approach slabs for existing bridges, construction of guardrails over embankments and approaches to bridges, and construction of new bridges.

10. Desilting of existing drainage lines.
11. Slope protection.
12. Quadrant pitching.
13. Ancillary works such as road lane marking and installation of traffic sign boards.

It is anticipated that the construction phase will last approximately 3 years, however the timeframe for each of these activities is not yet defined.

For the purposes of the ESIA, it is assumed that all of the woody, shrubby and herbaceous vegetation in the RoW will be cleared; and that all of the drainage lines within the RoW will be desilted. It is on this basis that the impacts are assessed and the mitigation measures determined.

☐ Materials

The main materials to be used for the project include, but are not limited to, the materials listed

Table 12: Materials

Materials
1. Cement 2. Steel rod, plates and bars 3. Crushed rocks, 4. Sand 5. Water 6. Diesel fuel and lubricants 7. Bitumen or asphalt 8. Wood for form works

☐ Employment

Employment opportunities will be available in the short-term during project activities. Priority will be given to skilled and unskilled workers from the local communities. However, the road to be rehabilitated is in rural Liberia where the availability of skilled labor is low, hence there is potential for an influx of non-local labor.

Employment will include equal opportunities for both men and women. A written statement in the contractor's contract will include commitment to adherence to the

prohibition of child labor according to the ILO Minimum Age Convention, 1973 (no 138), which sets the general minimum age for admission to employment or work at 15 years (13 years for light work) and minimum age for hazardous work at 18 years (16 years under certain strict conditions).

During construction, the project is expected to employ around expats and local workers (skilled and unskilled). Out of the total local workforce, 30% are estimated to be women of skilled, semi-skilled and unskilled qualifications.

Minimum key staff needed for the design and construction of the road is listed in Table 9. Skilled and unskilled local workers are listed in table 12.

Table 13: Key staff

Design Phase (Consultant'sStaff)	Construction Phase (Contractor's Staff)	Consultants
1. Resident Engineer 2. Assistant Resident Engineer 3. Bridge Design Engineer 4. Road Design Engineer 5. Chief Surveyor 6. Chief Quantity Surveyor (QS) 7. Quantity Surveyor (QS)	8. Road Manager 9. Chief Engineer Roads 10. Chief Engineer Bridges 11. Chief Quality control (QC) Engineer 12. Chief Surveyor 13. Chief Quantity Surveyor (QS) 14. Asset Management Specialist 15. System Analyst/Administrator 16. Resident Engineer – Road 17. Road Maintenance Engineer 18. Quantity Surveyor (QS)	19. Resident Engineer 20. Assistant Resident Engineer representative 21. Bridge Design Engineer 22. Transport Engineer 23. Road Design Engineer 24. Soil /Material Engineer 25. Environmental Manager 26. Community Liaison Manager

Table 14: Skilled Workforce

Category	Workforce

Constructors	Masons Carpenters Plumbers Electricians
Operators	Excavators Bulldozers Loaders Compactors Graders Asphalt Plant operators Pavers
Category	Workforce
	Rollers Backhoe operators Drillers Crushers
Workshops	Mechanics Welders Electricians Paver Mechanics
Drivers	Heavy Duty Drivers Light Duty Drivers Trailer Drivers Crane Drivers
Others	Steel Fixers Cooks Painters Survey Assistants Lab Assistants Crane Assistants Other Miscalleneous Staff

4 Project Alternatives

4.1 Basic Rationale

This ESIA study sought to consider possible alternatives to the proposed project. These alternatives included among other considerations the "No Project" Alternative, the Alternative Locations and the Alternative Designs.

4.2 Alternative Mode of Transportation

There are no alternatives to this road that fulfil the functions of providing relatively fast, cheap land transportation. Air, rail, and water transport are unlikely to either complement or substitute for roads or highways in this region. There is no railroad link in or near the project area. Hence, rail is not considered as an option. There are no water bodies that can be used as a mode of transportation in the project area. Streams or river in and near the project area are neither connected nor navigable. The only possible means is air transport but, this is a rather expensive alternative and cannot be used as an alternative to the road.

4.3 Do Nothing Option

This alternative implies that the selected road corridor in River Gee and Grand Gedeh counties will not be improved and that it would be left in its present state characterized by several defects and related impacts.

4.4 Engineering Intervention Option

This option assumes that engineering measures will be provided to correct the problems highlighted to improve the safety, health and social conditions of the local communities. In considering the various alternative solutions to the present state of the roads, the project aims of making accessible the Southeast region of Liberia to increase productivity, reducing transportation costs for the agricultural target centers and improving critical social services, and road safety, have been considered.

4.5 Route Alignment Alternatives

Factors such as engineering design standards and best practice, road safety, farming activities, existing and future mining activities, existing and future services, i.e. power lines, pipelines, and existing and future town developments were considered. Landowner needs were also considered, all within the norms of engineering, practicality and financial viability.

All parties, including project affected persons have agreed on the position of the alignment and the road reserve will be proclaimed and landowners and PAP will be paid compensation

4.6 Material Acquisition

Construction material – borrow materials (laterite gravel), sand and rock deposits identified are all within an average haulage distance less than 3km offsets from the existing road alignments. Acquisition of these materials will be established with the contractor and the MLME and with the consent of land owners. Impacts of transport of materials to site will not be significant as the distances are short and the road corridor is not very populated.

4.7 Route

Overall, the route from Putuken – John Davis Town Road Corridor is relatively passing through a number of rural towns. However, it has few straight sections because of the undulating terrain and the need to cross the numerous stream lines at advantageous points. As it is, the road will need some improvement in horizontal and vertical alignments for safe and comfortable ride. However, it is not intended to realign more than short sections, and to utilize the existing alignment to the greatest extent possible. By this means the project will avoid the need for significant additional land take.

4.8 The Preferred Alternative

The advantages to be derived from the road improvement alternative far outweigh the disadvantages of the "Do Nothing Option". Although there are environmental implications associated with the improvement alternative, appropriate mitigation measures would be

implemented to control them, thus justifying the case for implementing the project. Even though the initial cost of the paved road improvement program would be high, the accrued benefits to be derived from this option socially, environmentally, and economically, far supersede all other options. For reasons of life-cycle cost, safety, better, safer driving, environment, traffic volumes, and citizen interest, in the operational phase, an asphaltic concrete pavement surface consistent with the rest of the FTHRP corridor is recommended.

5 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

Environmental baseline data are important to understand the physical, biological, and socioeconomic characteristics of the project's environment. Such information sets the ground for the analysis of the potential impacts of the project's activities on the existing environment. Therefore, the collection of baseline data, presented in this chapter, focuses on the information required to conduct an ESIA for a road project.

5.1 Physical Environment

An assessment of the project area's physical characteristics was conducted based on the following items:

- a review of published literature on Liberia specifically River Gee and Grand Gedeh Counties,
- a review of documents provided by the project owners,
- a review of topographic, geological and hydrological maps of the project area,
- the consultant's general knowledge of the project area,
- observations during field visits to the project area in September 2018, and
- the sampling results for noise, water resources and soil.

This initial assessment helps provide the required baseline data to prepare a complete ESIA Report.

5.2 Topography

Liberia can be divided into three distinct topographical areas:

- a *flat coastal plain* which extends up to 80 km inland and is characterised by the abundance of creeks, lagoons, and mangrove swamps;
- an area of *broken, forested hills* with altitudes from 180–370 m, which covers most of the country; and
- an area of *mountains* in the northern highlands, with elevations reaching 1,384 m. The Putuken – John Davis Town Road is located within the broken, forested hills zone with altitudes between approximately 200 m and 300 m above sea level. This broken terrain is a peneplain formed through intense and prolonged weathering and erosion. It is characterized by deep, lateritic soils with gentle, rounded slopes, and dissected by numerous watercourses. 5.3

Meteorological Setting

The climate of Liberia is determined by the equatorial position and the distribution of low and high-pressure belts over the African continental landmass and the Atlantic Ocean. A fairly warm temperature with high humidity through most of the year occurs because of the moderating influence of the ocean and the tropical location.[6]

Meteorological data including primarily precipitation, ambient temperature, and wind direction and speed, are necessary for developing and understanding an important part of the environmental conditions in the region and consequently for adequately assessing environmental impacts in a comprehensive approach.

5.3 Precipitation

Liberia has two seasons: the rainy season and the dry season. The dry season lasts from November to April and the rainy season is from May to October. The average annual rainfall along the coastal belt is over 4,000 mm (157 inches) but reduces significantly to 1,300 mm (51 inches) at the forest-savannah boundary in the north.[7] Monrovia, the capital, receives almost 4,572 mm (181 inches) of rain per year. The corridor falls within a less rainy terrain; but notwithstanding, the land still receives over 1,775 mm (70 inches) of rain annually. The months of heaviest rainfall vary from one part of the country to another, but are normally June, July and September. Observations concerning the diurnal distribution of rainfall prove that most of the rain received along the coast falls during the night and early morning.

5.4 Wind

The seasons in Liberia mainly result from the movement of air masses:

- the Inter-Tropical Convergence Zone (ITCZ), which shifts northwards across Liberia for the northern hemisphere summer,

[6] UNDP, 2006. First State of the Environment Report for Liberia. Monrovia, Liberia.
[7] Bongers, F., Poorter, L, Van Rompaey, R.S.A.R, and Parren, M.P.E, 1999. Distribution of Twelve Moist Forest Canopy Tree Species in Liberia, and Cote d'Ivoire

- the moist air masses over the Atlantic Ocean, which are drawn in from the south, and dry continental air that is drawn off the interior of North Africa during the northern hemisphere winter, particularly pronounced as the Harmattan.

The pressure shifts between the air masses, driven by the seasonal movements of the sun, force the dry continental air mass and the moist south-equatorial maritime air mass to replace each other roughly every six months.

5.5 Relative Humidity

The relative humidity in Liberia is high throughout much of the year. A relative humidity of 90% to 100% is common during the rainy season. During the dry season, it decreases to as low as 65%. Along the coast, it does not drop below 80%. On average, it is above 90%. There is a wider variation in the interior and the relative humidity may fall below 20% during the Harmattan period, which is characterized by a dust-laden wind from the Sahara Desert.[8] Recent or historical data on humidity in the project area are not available.

5.6 Geological Setting

The geological investigations in Liberia have shown that nearly all of the terrain is underlain by Precambrian crystalline metamorphic rocks which form part of the West Africa shield, known as the Guinea Shield. The rocks forming this crystalline shield are a series of granite, gneiss, and schist beds, which have resulted from metamorphism by tectonic forces acting on a regional scale. The structural features of the rocks in this region are uniform over relatively large areas. Gneissic structure and schistosity dip at high angles in most places and are often vertical.

Most of the Putuken - John Davis Town Road Corridor develops in the Pan-African Belt. The rocks of the region date from the Paleoproterozoic age. Over them, some alluvial flood plains are developed, particularly in bands close to the main rivers. Also, some Aeolian deposits are noticeable. These are related to the Harmattan winds from the Sahara Region.

[8] UNDP, 2006

5.7 Water Resources

5.7.1 Existing Water Resources in the Project Area

Communities along the road rely on wells and hand pumps for drinking, cooking, cleaning and sanitary use. Major groundwater sources include wells with hand pumps, most of which were installed during the emergency relief program following the civil war, and shallow hand-dug wells, which are prone to contamination from rural run-off and pose infection risk to the communities.

The communities living in the project area also rely on surface water bodies for their water supply, especially during the dry season when the wells are almost dry. Moreover, the local communities use the local creeks for livelihood activities such as fishing and transport.

The area crossed by the road is abundant with water bodies. Three major watercourses drain the area. Understanding the local surface and groundwater quality is an important factor in the project's impact assessment and helps design proper mitigations. This important piece of work was not undertaken during the course of this ESIA due to several constraints. The project will conduct water quality analysis for major water courses intersecting the Putuken to John Davis Town corridor prior to the commencement of work. This exercise will also be carried out for a number of wells along the road that have the risk of being polluted by project activities.
Information gathered will provide the benchmark for future monitoring activities.

5.8 Soil

5.8.1 Soils in Liberia

The Liberian hinterland is an ancient geological landscape where the humid tropical climate has caused intensive mechanical and chemical weathering of the parent rock and leaching of the soil profile for millennia. The bedrock from which the soils have formed are mainly of crystalline, igneous and metamorphic origin, consisting of granites, gneisses, schists and

shales. The three major soil groups in Liberia are ferralsols or latosols, lithosols or leptosols, and regosols (coastal and alluvial sands), though other soils occur locally as described below for River Gee and Grand Gedeh Counties.

It is important to appreciate that soils in Liberia are mostly not fertile, despite the lush growth of herbaceous vegetation during the wet season. They are very heavily weathered as a result of the prolonged heat and humidity of the tropics, leading to dominant clays that retain few nutrients, volatilised organic matter and rain-leached profiles. It is these features that lead to the way in which the landscape is managed. In particular, the prevalence of shifting cultivation is a sound agricultural response to this situation, although it is destructive of primary forests and of questionable sustainability. The production of tree crops is also appropriate in this setting, because the deeper rooting of trees allows them to access nutrients that are leached from the upper soil horizons.

Table 15: Summary of the main soil found in the project area

Position	Soil group	Summary description
Upland soils	Ferralsols and ferralic cambisols (Main slopes and undulating land)	Strong brown to dark red, well drained soils developed in-situ from deeply weathered gneiss or ironstone (iron-ore bearing) bedrock, occurring on undulating to steeply sloping dissected plains and major hill slopes. The soils are mainly deep (>2.0m), fine-gravelly clays and sandy clays with weakly developed subangular blocky structures. Many soils are also gravelly. Sandy soils occur, as do shallow soils overlying very stony and bouldery ironstone.
	Leptosols (Hill tops and upper slopes)	very shallow soils over continuous rock and soils that are extremely gravelly or stony, or both. In Nimba they are mainly found on hill tops, on hard iron formations or on hard granite domes.
Valley soils	Gleysols (Valley margins)	Yellowish brown to brown soils occurring at the margins of the dissected plains and valley bottoms on gently sloping to undulating old alluvial or colluvial terraces and in-situ on weathered gneiss or colluvial

		toe slopes. Soils are clayey or loamy textured, weakly structured, well to imperfectly drained and usually affected by groundwater: this is shown by mottling in the subsoil.
	Gleysols (Valley bottoms)	Mainly deep, very poorly drained, gleyed alluvial soils of varying texture, occurring in the small and usually swampy valley floors within the uplands. The soils are grey, mottled, gleyed and affected by shallow groundwater. Some soils are peaty.
	Fluvisols (Floodplains)	Dark brown to yellowish brown deep alluvial soils bordering the main rivers and flooded annually. Soil textures are variable and frequently stratified. Soils are well to moderately well drained.

5.9 Biological Environment

5.9.1 The Setting.

Nationally, Liberia's forests represent an important ecosystem for a variety of fauna and flora, providing habitat for more than 2,200 vascular plant species, nearly 590 bird species (13 of which are found nowhere else), and more than 100 mammals such as the pygmy hippopotamus, the Diana monkey, and the critically endangered West African chimpanzee. Much of the forest has been either degraded through partial conversions for shifting agriculture and logging, or full-scale change due to the development of plantations, infrastructure and mining. Despite this, some large tracts of primary forest remain, mostly in the north-west and south-east of Liberia, and in pockets elsewhere. These become increasingly fragmented and isolated away from the core forest areas. In River Gee and Grand Gedeh counties, they are relatively limited mainly to the scattered forest with less human settlement.

Moves to preserve Liberia's forests complement efforts made across West Africa to guarantee the protection and connectivity of forest lands within the Upper Guinean rain forest. Protection in the past has included the reservation of forests for both conservation and logging, and since 2009 has included legal protection for community-managed forests

(which usually include at least some harvesting). Nevertheless, protection for conservation has become more widely gazetted in recent years, with a growing number of nature reserves and national parks, as shown figure below. Other conservation designations are also present, including Ramsar wetland sites, Key Biodiversity Areas, and Important Bird and Biodiversity Areas.

5.9.2 Protected Areas, Natural and Critical Habitat

There is no nationally or internationally protected area crossed or located near the road from Putuken – John Davis Town. As well as there being no national parks or nature reserves in the area, none of Liberia's RAMSAR wetlands of international importance, Key Biodiversity Areas, or Important Bird and Biodiversity Areas occurs in the vicinity of the road.

The whole area of the road corridor runs through modified habitat, without natural or critical habitats. There are currently 5 protected areas and 11 proposed protected sites in Liberia as shown below in Figure 3. None of these protected and proposed protected areas are along the corridor.

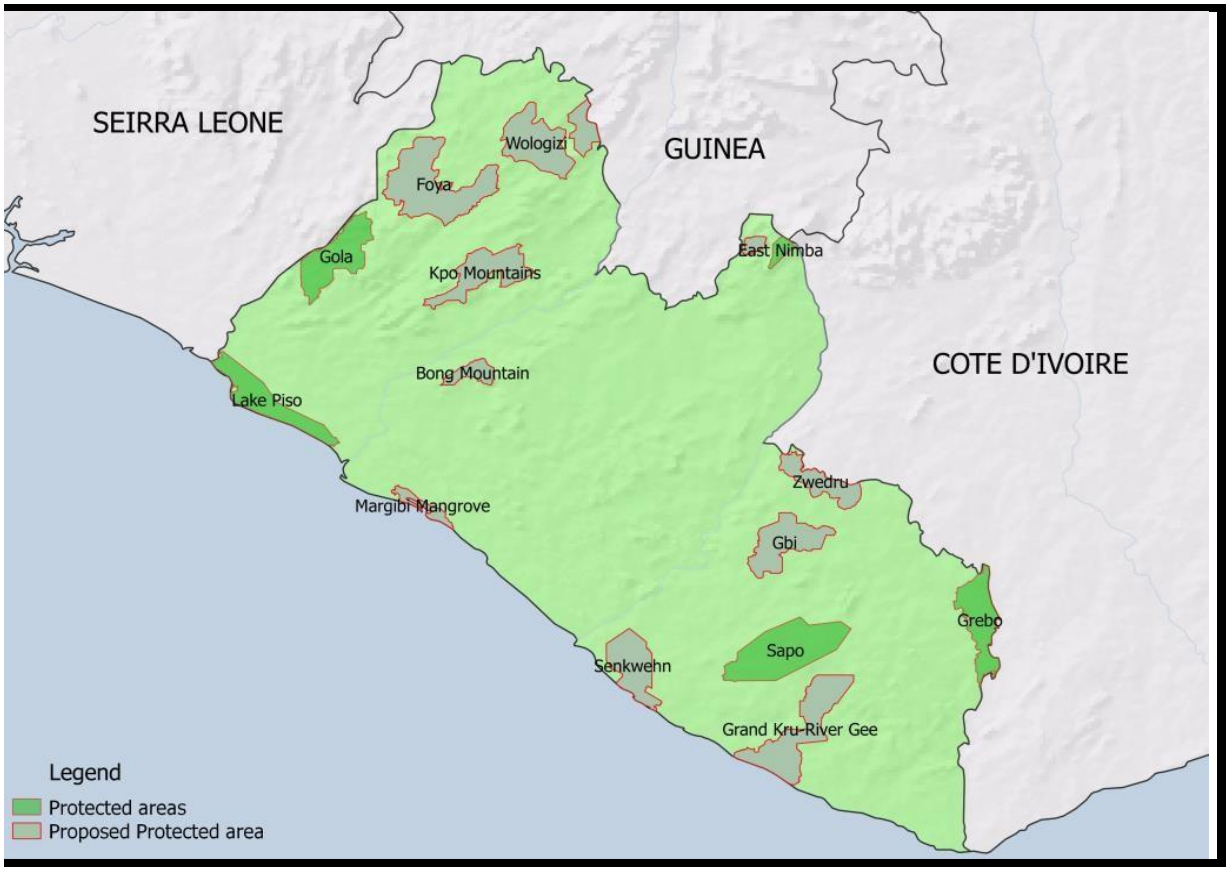

Figure 5: Protected Areas Map of Liberia

The area traversed by the road supports a great deal of vegetation, but there is no primary forest remaining in the road corridor. All of the remaining uncultivated forest is secondary regrowth, resulting from major disturbances through a combination of shifting cultivation and logging. The project area does not include any montane locations, but the numerous creeks and rivers mean that there is a considerable amount of riverine forest in the corridor, and this tends to be more biodiverse than dryland forest in terms of both flora and fauna.

As observations on the ground shows, most of the impact of the existing road is very narrow, usually extending only a few hundred metres from the road at most. Broader zones of land converted from forest to other uses are seen around the towns, where it is the dense

urban population rather than the road itself giving rise to a wider area of impact on land cover.

The main crops cultivated are Cocoa, maize, cassava, rice and plantain, but often the crops are not intensively cultivated or maintained. This may change once the upgraded highway gives access to markets, but the current baseline is one mainly of shifting cultivation, poorly managed plantations and degraded forest.

The socio-economic survey included a review of access to the forest and bush, and the importance of it to households. It is clear that there is a high dependence on natural resources by households in the more rural areas, helping to account for the lack of primary forest. A wide range of non-timber forest products are collected, in addition to the use of small timber for firewood and charcoal production. Provision for increased understanding of this is incorporated in the ESMP to ensure that mitigation measures are best targeted, and potentially important plant species are protected.

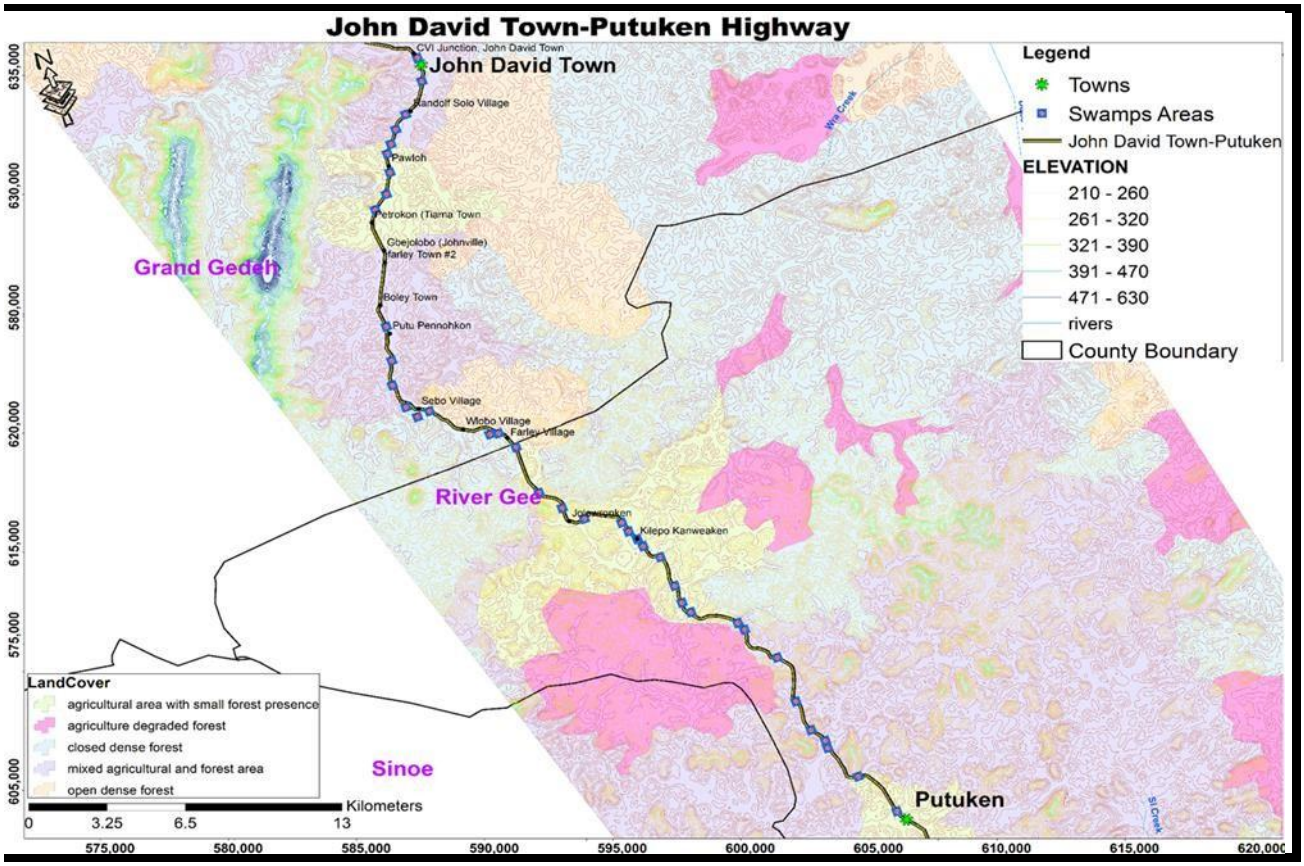

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Figure 6: Land Cover Map of the Project Area

5.10 Fauna

Mammals may be relatively scarce in the project area because of the fragmented nature of the forests. Nevertheless, studies have showed that, mammals are relatively rich in number throughout many parts of Liberia. The section of road that passes through the better forest cover has a higher incidence of mammals. Mammalian species usually found in disturbed areas are rodents, including cane rats and squirrels. Less common species are the antelopes, duikers, foxes and monkeys that tend to be found in the less disturbed forests. Chimpanzees (i.e., the western chimpanzee, *Pan troglodytes verus*) occur in areas throughout the country.

It is not considered that the project will have any significant impact on birds, although precautions should be taken to ensure that wildlife in general is not unduly affected. This would include the strong discouragement of bush meat hunting, that frequently includes birds.

Other fauna that are present in the road corridor are summarised below.

- Reptiles that might be found in the project area include lizards, skinks and numerous snakes.
- Amphibians include a large number of ground-dwelling and arboreal frogs.
- Fish species, including catfish, crayfish, tilapia, bonny, sunfish, and mudfish, are usually found in the inland riverine and lacustrine wetlands of Liberia. These species may be encountered in the creeks, streams and wetlands crossed by the road.
- A large number of invertebrates occur in the habitats crossed by the road. Among these, butterflies, dragonflies and damselflies are of particular interest. The occurrence of particular species of invertebrates often provides indications of the level of disturbance of habitats, and it is proposed that this should be the subject of further investigation as part of the ESMP.

Bush meat hunting is a strong potential threat to native fauna. In terms of determining the current baseline and future trends, it is important to understand the prevalence of this activity, since its impacts might later be confused with environmental deterioration caused by road upgrading. The socio-economic surveys report found that bush meat consumption was widespread, particularly in the most remote rural villages. Around 90 percent of households consume bush meat and a third of households hunt at least weekly, and some of them daily. Further research is necessary on this topic, to establish more information on the species and approximate numbers of animals killed. This is incorporated in the ESMP, to ensure that the mitigation measures are closely targeted and help to reduce pressure on less abundant species.

5.11 The Socio-Economic Baseline Survey

The communities in the project area of influence have social network and support systems. Generally, the social networks include associations along professional lines. For example, tailors, marketers; other associations are on the basis of age, such as youth groups. On the other hand, some associations are on gender basis such as the woman development groups. Such interactions are used to promote and protect personal relationships and welfare. Other social network in the project area of influence is called "Susu". This social network is particularly a support group of small-scale businessmen and women, investors coming together for saving and loan purpose. The Susu does not only provide financial security to its members but fosters solidarity and greater cohesion within the communities.

5.11.1 Demographics and Ethnic Composition

The population of Grand Gedeh County is estimated at 125,258 with male and female populations at 51.9% and 48.1% respectively. For River Gee County, the population is estimated at 71,509, with male and female at 52.1% and 47.9% respectively (LISGIS, 2011). In Grand Gedeh County, the road under Lot 3 traverses the Tchien and Putu Districts, while in River Gee County, the road traverses the Chedepo, Gbeapo and Nyenawliken Districts.

The total population of Tchien and Putu Districts is 48,402, representing 38.6% of Grand Gedeh County population, with male to female population ratio estimated at 51.9% to 48.1%. For River Gee County, the total population of Chedepo, Gbeapo and Nyenawliken Districts is 26,611, representing 39.8% of the county population, with male to female ratio estimated at 52.2% to 47.8%.

There are about 22 towns and villages along the proposed corridor. They include: Putuken, Camp-4 Village, Sargba Village, Saywonken, Rock Crusher, Combat Gate, Kilepo Kanweaken, Jolowroken Town, Peter Village, Farley Village, Farley Town, Wolabo Village #1, Wolabo Village #2, Sebo Village, Putu Pennokon, Boley Town, Farley Town, Gbejolebo Town, Petrokon cka Tiama Town, Panwloh Town, Randall Solo Village and John Davis Town. During the socio-economic study of the project area, a sample size of the population was considered. A total of 139 persons were interviewed in Grand Gedeh County– 64 males and
75 females. Out of this sample population, 77.7% fell between the ages of 18 and 59, while 22.3% were 60 or above. This latter group of persons was seen to be non-active. For River Gee County, 59 persons were interviewed within the limit of Lot 3 – 30 males and 29 females. Of this group, 84.7% fell between the age 18 and 59, while 15.3% were 60 and above. This group too was seen inactive.

The main ethnic group in Grand Gedeh County is Krahn – 88.5%, while the main ethnic group in River Gee County is Grebo – 67.8%. other tribes present were Kpelle, Mandingo, Kru, Lorma, Gio and Mano.

Most of the respondents in Grand Gedeh County (98.6%) were Christians and 1.4% was Muslims, while in River Gee County, Christians were 91.5% and Muslims 8.5%. This in line with the national figures of 85.5% Christians and 12.2% Moslems, 0.5% practitioners of African Traditional Religion and 1.5% who professed no religious affiliation.

5.11.2 Vulnerable Groups

Vulnerability is closely related to income or access to income generating opportunities, age, educational status and lack of protection or destruction of the family unit during the civil war. Female headed households tend to have access to fewer income generating opportunities (see below), report fewer survival strategies and have both young and older dependents.

Traditional society before the civil war looked after and respected the contribution of the elderly to community management and support. Older family members were looked after by their children and were less likely to be in need of basic amenities such as shelter, food, care etc. The civil war caused the breakdown of the family in very many cases, particularly through the following:

- People had to flee and families broke up. Many families had to move many times during the war and lost family linkages, belongings, land and entitlement to a livelihood.
- Many people died as the result of violence, increased disease and lack of health facilities, leaving less able family members without support. Social ills of alcohol, gambling and drug abuse increased, reducing support to family members.
- Girls in particular were abused and abandoned, leaving young girls with infants and no support. Prostitution increased as women tried to survive, but resulted in lack of support and no menfolk as part of the family unit.
- Education services stopped, leaving young people with low levels of literacy and numeracy, and no means to enter training opportunities that required basic skills.
- Households had to survive as best they could, leading to members migrating for work.

The result was broken families, fractured relationships, abandoned elders and children, and young people who had lost their educational opportunities or who had to drop out of school for lack of basic support for survival.

Vulnerable groups are therefore described as:

- Illiterate household heads with other family members lacking education or school drop outs;
- Women headed households;
- Disabled family members;
- Households comprising only persons older than 55; ◆ Households headed by children under 18 years; and
- Landless rural households.

These groups need special attention during the resettlement phase to ensure that their livelihoods are maintained or improved and that further disadvantage does not accrue. Statistics relating to these vulnerability criteria are discussed in the relevant sections. The average age of male headed households was 44.5 years whereas for women the average age of female headed households was 55.4 years, indicating that a higher proportion of female headed households have elderly heads and members, and are more likely to be vulnerable.

There were few reported instances of disabilities amongst the surveyed households with no significant variation across sex or age groups.

5.11.3 Governance and Administrative Context

The basic unit of local government is the office of the Town Chief. The Chief operates at the interface between older governance systems and the modern administration. The relationship between the Chief system and local administration is enshrined in law. In theory, the Town Chief collects all legal taxes on behalf of the government. In reality, chiefs tend to collect taxes for redistribution at the town level or otherwise. The collection of

taxes tends to be arbitrary. The Town Chief is officially responsible for allocating communal land for farming among the town people.

The Town Chief reports to the Clan Chief, head of a clan or a group of towns. The Clan Chief is responsible for addressing indigenous issues within his clan. Serious issues which cannot be solved by the Town Chief are brought to the Clan Chief for resolution. The Clan Chief reports to the Paramount Chief, who is head of the Clan Chiefs, Elders and Town Chiefs. The Paramount Chief is the head of cultural and indigenous activities and adjudicates on matters in each district that cannot be solved by the Clan Chief. There are eight Paramount Chiefs in the area crossed by the road (one of whom is female) and thirteen Clan Chiefs (one of whom is also female). Each town has its own Town Chief. Chiefs are advised by the Elders, some of whom are women.

The chiefdom system is the main route for information transfer to the towns and villages. The Paramount Chief reports to the District Commissioner of each district, who supervises, monitors and evaluates all administrative matters arising from the Paramount Chiefs' offices. The District Commissioner reports to the County Superintendent, who is appointed by the President. The County Superintendent is the executive head of the county; he or she has oversight over all public officials within the county.

5.11.4 Access to Key Resources and Infrastructure

Zwedru and Fish Town are the main urban centres for people living along the road and have the widest variety of services and facilities. These include hospitals; elementary, Junior and Senior high schools; churches; mosques; police depot; alocal markets; and two banks only in Zwedru. Unlike Fish Town, Zwedru also has the Liberia Electricity Corporation power supply through the West African Power Pool and Liberia Water Sewer Water Supply.

5.11.5 Types of Agriculture Identified

The plot number recorded appears low. Some 70 plots are house plots, some with some crops on as well as the house. The majority of plots are lowland swamp, usually used for rice all year round, and upland farms growing rice in the rains. Few plots are devoted to cash crops such as rubber, coffee and cocoa. Respondents stated that it is difficult to get cash crops out to market and so they stick with subsistence farming.

5.12 Economic Activities and Income Sources

5.12.1 Distribution and Profitability of Economic Activities

While rural economies in sub-Saharan Africa are commonly understood as predominantly based on subsistence agriculture, it was found that the local communities within the project area were engaged in "business" – petty trading – and majority engaged in farming. Few households are engaged in livelihoods that depend on access to communal natural resources. In particular, those selling charcoal and bushmeat sourced these mainly from communally accessed forested areas.

5.13 Gender-based Violence and Sexual Exploitation

5.13.1 National Setting

Liberia has ratified or acceded to the core international human rights treaties. It is a party to the major regional human rights instrument which obliged states to respect, protect and fulfill human rights of all persons within the territory and subject to the jurisdiction of the state, without discrimination. As a state party to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (the "Maputo Protocol"), Liberia has made legally binding commitments to exercise due diligence to combat gender-based violence (GBV) and discrimination.

Accordingly, Liberia has an obligation to take all appropriate measures to prevent rape, ensure that there are adequate sanctions for rape in law and in practice, and ensure access to reparation for the victims. CEDAW art. 2(c), for example, provides that states must

"establish legal protection of the rights of women on an equal basis with men and ensure through competent national tribunals and other public institutions the effective protection of women against any act of discrimination." The Maputo Protocol, art. 4, paras. 2(a) and (e), explicitly provides that laws prohibiting violence against women must be enforced and perpetrators held accountable. Furthermore, several human rights instruments (i.e. CRC, CEDAW, CRPD, ACRWC, and the Maputo Protocol) require Liberia to take special measures to protect the rights of individuals who are vulnerable to sexual violence – mainly women, children, and persons with disabilities.

The United Nations Special Rapporteur on violence against women has provided guidance on states' due diligence obligations in combating sexual violence, noting that it must be implemented at both individual and systemic levels. Individual due diligence focuses on the needs of individual survivors and "places an obligation on the state to assist victims in rebuilding their lives and moving forward," for instance through the provision of psychosocial services. Individual due diligence "requires states to punish not just the perpetrators, but also those who fail in their duty to respond to the violation" (Report of the Special Rapporteur on violence against women, its causes and consequences, para. 70, UN Doc. A/HRC/23/49, 14
May 2013). As for systemic due diligence, it includes ensuring "a holistic and sustained model of prevention, protection, punishment and reparations for acts of violence against women.

Liberia experienced a high level of GBV during the civil wars, but it appears to be an ongoing issue. The UN Women Global data base on violence against women revealed that prevalence of different forms of violence against women in Liberia is as summarized below.

- 39 percent of women aged 15 to 49 have experienced intimate partner physical or sexual violence at least once in their lifetimes, and 36 percent have experienced it in the last 12 months,

- 36 percent of women aged 20 to 24 years were in their first marriage or union before the age of 18.
- 50 percent of women aged 15 to 49 years have undergone female genital mutilation.

5.13.2 County Setting

The Ministry of Gender, Children and Social Protection (MOGCSP) has offices at the county level to help mainstream gender issues and increase public awareness on the unacceptability of GBV. In a consultation with the MOGCSP on how to minimize or stop GBV in the project area, a number of suggestions were made on practical measures that have been incorporated into the ESMP.

5.14 HIV/AIDS

The HIV and AIDS epidemic is a significant public health and development problem in Liberia. The primary modes of HIV transmission in Liberia as elsewhere in sub-Saharan Africa are heterosexual contact and perinatal transmission; although blood transfusion, medical transmission and use of dirty needles still occur. Many factors fuel the spread of the epidemic.

These include, the widespread norm of multiple and concurrent sexual relationships; women's low socioeconomic status; increasing levels of poverty leading to sex work; lack of open discussion about sexuality; high incidence of sexually transmitted infections (STIs); cultural and religious beliefs, and stigma and discrimination, among others. HIV and AIDS epidemic is a social problem, as much as a medical one. The fault lines are wide opened channels creating a superhighway for the spread of HIV and AIDS. Partner reduction and consistent and correct use of condoms creates cracks in this highway to slow down or even reverse the rate of transmission over time. Without appropriate interventions, the risks of transmission, including mother-to-child transmission will continue to the next generation.

While the project can contribute significantly in combating HIV/AIDS and other diseases by providing access to health services, the likelihood of the construction phase causing an influx of mainly single male laborers is high. This could give rise to contractors' workers increasing the prevalence of HIV/AIDS, sexually transmitted diseases, sexual harassment of women and girls, and exploitive sexual relations.

6 ASSESSMENT OF IMPACTS

The purpose of the environmental and social impact assessment (ESIA) of the road project is to improve decision making and to ensure that the project progresses in a sustainable approach. The ESIA identifies ways of improving the project environmentally and socially by preventing, minimizing, mitigating, or compensating for adverse impacts. These measures will help to avoid potentially costly remedial measures.

The environmental impacts caused due to the development of the project road can be categorized as primary (direct) and secondary (indirect) impacts. Primary impacts are those which are induced directly by the project, whereas the secondary impacts are those which are indirectly induced and typically include the associated investment and changing patterns of social and economic activities due to the proposed action. Interaction of the project activities with environmental attributes is presented as Activity-Impact Matrix in Table 16.

Table 16: Potential Impact matrix

	Significance of impact	Sensitivity		
		Low	Moderate	High
Magnitude of impact	Negative impacts			
	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major
	Positive impacts			
	Positive	Minor	Moderate	Major

Potential direct and indirect impacts of the project during construction phase will be the following:

a) Involuntary resettlement and land acquisition resulting to loss of properties and public utilities, farmlands, income generating sources, and cultural sites
b) Filling in low-lying areas for embankments of the road
c) Loss of vegetation due to the cutting of trees
d) Loss of topsoil due to clearing & grubbing of new alignment, borrow area, and quarry operation, construction of camp, material stacking yard
e) Temporary impacts in terms of the polluted environment on flora and fauna due to the construction activities
f) Impact on the drainage pattern due to raised embankment, introduction of new culverts and bridge constructions
g) Impact on Traffic Management System
h) Increased air pollution (including dust) during project road construction
i) Increased noise level due to the movement of vehicles and construction activities
j) Increased risk of soil erosion due exposure soil resulting from vegetation clearance
k) Pollution of surface and sub-surface water sources resulting from Spillage of oils and other hazardous materials
l) Pollution due to generation of spoils and solid waste
m) Loss of trees and construction activities and impacts on tranquillity of material sites and quarries
n) Increased risk of transmission of communicable diseases

Potential direct and indirect impacts of the project during the operation phase are the following:

a) Increased noise pollution due to the vehicular movement
b) Impact on the natural drainage pattern of the project area

c) Pollution of water bodies and impacts on its ecosystem due to hazardous chemical or oil spillage into streams and wetlands.

The positive impacts of the project will be:

a) Reduced air pollution due to better service levels of the road
b) Improved safe and efficient connectivity in the project area
c) Generation of local employment during road construction
d) Improvement of local economy and industry due to better infrastructure facilities

6.1 Summary of Potential Impacts

Table 17: Summary of Potential Impacts

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
A. POSITIVE IMPACTS									
Improved supply of transport services	Indirect	Regional	Long-term	N.A.	Positive	High	Major	N.A.	N.A.
Reduced transport costs	Indirect	Regional	Long-term	N.A.	Positive	High	Major	N.A.	N.A.
Reduced travel time	Indirect	Regional	Long-term	N.A.	Positive	High	Major	N.A.	N.A.

Reduced dust nuisance from unpaved highway	Direct	Towns in road corridor	Long-term	N.A.	Positive	Medium	Moderate	N.A.	N.A.

The potential impacts of the proposed project have been listed in Table 11 below and analyzed into different categories based on the stakeholders' views, perceptions, and the consultant's previous experience in undertaking road projects ESIAs and experiences gained from other road construction projects.

The impacts of the project will be both positive and negative. They have been presented according to the various phases of project cycle which includes construction, operation, and decommissioning phases.

Table 18: Potential Impact of the Project

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
Reduced sediment in roadside	Direct	Regional	Long-term	N.A.	Positive	Medium	Moderate	N.A.	N.A.

watercourses									
Employment opportunities during construction	Direct	Road corridor	Project duration	N.A.	Positive	Medium	Moderate	N.A.	N.A.
Improved opportunities for business with greater movements of people and goods, and reduced transport costs	Induced	Towns in road corridor	Long-term	N.A.	Positive	Medium	Moderate	N.A.	N.A.
Improved access to social services, including health and educational facilities	Induced	Regional	Long-term	N.A.	Positive	Medium	Moderate	N.A.	N.A.

Improved opportunities to access agricultural markets	Induced	Regional	Long-term	N.A.	Positive	Medium	Moderate	N.A.	N.A.
B. NEGATIVE IMPACTS									
1. Overall Impacts									

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation

1.1 General environmental damage in the form of degraded land, lowered quality of living, reduced quality of resources, etc., mainly in the affected rural communities along the road.	Direct, Indirect	Road corridor	Permanent	Constant	Medium	Medium	Moderate	and Prevention restoration	Negligible

1.2 Limited awareness or respect about the importance and value of the environment among labour force leads to an excessive amount of damage to resources or disruption of people's livelihoods in the roadside	Direct	Towns in road corridor	Project duration	Constant	Medium	Medium	Moderate	Prevention	Negligible

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy	Residual significance after mitigation

								(actions defined in ESMP)	
2.1 Injuries occur to the public, especially children, during works.	Direct	Road corridor	Project duration	Frequent	Small	Medium	Minor	Prevention	Negligible
2.2 Injuries occur to the public from exposure to hazardous substances (e.g. cement, diesel) in the affected communities along the road.	Direct	Road corridor	Project duration	Frequent	Small	Medium	Minor	Prevention	Negligible

2.3 Infectious and contagious diseases are spread amongst the communities near the road.	Indirect	Towns in road corridor	Project duration	Constant, but worse seasonally	Medium	Medium	Moderate	Prevention	Negligible
2.4 Sexual exploitation and gender-based violence increase in local communities, particularly the rural towns due to the influx of temporary laborers	Indirect	Towns in road corridor	Project duration	Constant	Medium	Medium	Moderate	Prevention	Negligible
3. Occupational Health and Safety Impacts									

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
3.1 Workers are unaware of the dangers from the sites (roadline, quarries, batching plants etc.) they are working in, leading to high rates of injury.	Direct	All active work sites	Project duration	Constant	Medium	Medium	Moderate	Prevention	Negligible
3.2 Injuries due to inadequate provision of safety equipment	Direct	All active work sites	Project duration	Constant	Medium	Medium	Moderate	Avoidance	Negligible

4. Community Impacts									
4.1 Incoming workers do not respect local communities, leading to social disruption, particularly in the rural towns.	Indirect	Towns in road corridor	Project duration	Frequent	Small	Medium	Minor	Prevention	Negligible
4.2 Houses are lost in the road right of way.	Direct	Road corridor	Permanent	One-off	Large	High	Major	Compensation	Minor

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy	Residual significance after mitigation

								(actions defined in ESMP)	
4.3 Loss of land use and business sites in the road right of way, particularly in the three cities.	Direct	Road corridor	Permanent	One-off	Medium	Medium	Moderate	Compensation	Negligible
4.4 Cultivated land and crops are disturbed or destroyed, mainly in the rural areas along the road and in the locations chosen for quarries,	Direct	Road corridor	Long-term	Constant, but worse seasonally	Medium	Low	Minor	or Avoidance reduction	Negligible

borrow areas, camps, batching plants, etc.									
4.5 Local people's livelihoods are adversely affected by project activities.	Direct, Indirect	Road corridor	Short-term	Constant	Small	Medium	Minor	Avoidance or compensation	Negligible
4.6 Cumulative losses are incurred by social groups unable to	Indirect	Road corridor	Long-term	Constant	Medium	Medium	Moderate	Prevention	Minor

respond to change.									
5. Traffic Impacts									

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
5.1 Use of public roads by project vehicles increases the accident rate and generates nuisance levels of dust:	Direct	Mainly the road corridor and surroundings	Project duration	Constant	Medium	Medium	Moderate	Reduction	Minor

5.2 Increased traffic on public roads, running at faster speeds, leading to more accidents and more serious accidents:	Induced	Regional	Long-term	Constant	Medium	Medium	Moderate	Prevention	Minor
6. Cultural Heritage Impacts									
6.1 Cultural sites are damaged, anywhere that new land is cleared, such as for diversions, camps, quarries and borrow areas.	Direct	Road corridor	Permanent	Occasional	Medium	Medium	Moderate	Avoidance	Negligible
7. Hazardous Materials									

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
7.1 Pollution to air, soil or water and danger (illness or injury) from the delivery and handling of hazardous materials (including bitumen, mixed asphalt, fuels, lubricants and cement) at project camps, workshops, plants and	Direct	Most work sites	Project duration	Constant	Large	Medium	Major	and Prevention restoration	Negligible

construction sites.									
7.2 Pollution to air, soil or water and danger (illness or injury) from fuel and oil storage at project stores and workshops.	Direct	Most work sites	Project duration	Constant	Large	Medium	Major	Prevention and restoration	Negligible

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
7.3 Pollution to air, soil or water and danger (illness or injury) from refuelling operations at project camps, workshops, plants and construction sites.	Direct	Most work sites	Project duration	Constant	Large	Medium	Major	and Prevention restoration	Negligible
7.4 Pollution to air, soil or water and danger (illness or injury) from concrete and	Direct	Batching plant sites	Project duration	Constant	Large	Medium	Major	and Prevention restoration	Negligible

asphalt batching plants									
8. Construction Materials									
8.1 Damage to the land (degradation, loss of soil and cover, reduced productivity) from borrow pits and quarries	Direct	Material sources	Long-term	Constant	Large	Medium	Major	and Reduction restoration	Minor

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation

8.2 Disturbance (noise, dust and traffic accidents) and danger of injuries from quarry operation – general	Direct	Material sources	Project duration	Constant	Medium	Medium	Moderate	and Prevention restoration	Negligible
8.3 Disturbance (noise and dust) and danger (serious injury or death) from quarry operation – explosives and blasting	Direct	Material sources	Project duration	Constant	Medium	Large	Major	Prevention	Negligible
9. Impacts of Waste Materials									

9.1 Pollution of soil or water and illhealth from waste generation and management at camps and construction sites.	Direct, Indirect	Most work sites	Project duration	Constant	Medium	Medium	Moderate	and Reduction restoration	Negligible
9.2 Pollution of soil or water and illhealth from waste disposal at camps.	Direct, Indirect	Most work sites	Project duration	Constant	Medium	Medium	Moderate	and Reduction restoration	Negligible

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation

9.3 Pollution of soil or water from poor sanitation at work sites – camps and construction sites.	Direct	Most work sites	Project duration	Constant	Medium	Medium	Moderate	Prevention	Negligible
9.4 Pollution of soil or water from site camps and stores.	Direct, Indirect	Most work sites	Project duration	Constant	Medium	Medium	Moderate	Prevention and restoration	Negligible
10. Soil Loss									
10.1 Erosion and physical damage of soils and earthworks – all construction sites, camps and ancillary	Direct	Road corridor and most work sites	Permanent	Constant, but worse seasonally	Large	Large	Major	Prevention and restoration	Minor

infrastructure areas.									
11. Pollution of Water									

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
11.1 Damage to water resources by pollution with sediment or chemicals in runoff in any of the 11 major creeks and many, minor	Direct	Regional	Long-term	Constant, but worse seasonally	Large	Large	Major	and Prevention reduction	Minor

creeks crossed by the road, or nearby wetlands and water supply boreholes.									
11.2 Pollution by entrained sediment from poor drainage systems entering any of the 11 major creeks and many, minor creeks crossed by the road, or nearby wetlands and	Direct	Regional	Long-term	Seasonal	Large	Large	Major	Prevention	Minor

water supply boreholes.									
12. Air Pollution									

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
12.1 Dust from construction sites and access tracks to ancillary infrastructure	Direct	Road corridor and most work sites	Project duration	Seasonal	Medium	Medium	Moderate	Reduction	Minor

affects local communities and crops									
12.2 Exhaust fumes affect local communities close to the road and all project ancillary infrastructure.	Direct	Road corridor and most work sites	Project duration	Constant	Small	Medium	Minor	Reduction	Negligible
13. Biodiversity Impacts									

13.1 Vegetation other than invasive species (i.e. both natural plants and farm plants) is damaged or destroyed unnecessarily – beyond the agreed boundaries, particularly natural plants in the forested sections	Direct	Road corridor and most work sites	Long-term	Constant	Medium	Medium	Moderate	and Prevention restoration	Minor

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy	Residual significance after mitigation

								(actions defined in ESMP)	
13.2 Increased but poorly controlled exploitation of forest resources, including NTFPs, as a result of improved road access, particularly natural plants in the forested sections.	Induced	Road corridor	Long-term	Constant	Small	Medium	Minor	Prevention	Negligible

13.3 Wild animals other than very common or non-native pest species are killed, particularly in the forested sections	Indirect	Road corridor	Long-term	Constant	Medium	Medium	Moderate	Prevention	Minor
14. Noise and Vibration Impacts									
14.1 Noise disturbance at excessive levels from construction activities, quarries, borrow areas and batching plants.	Direct	Towns in road corridor	Project duration	Constant	Medium	Medium	Moderate	Reduction	Minor

Impact/Risk	Causality	Extent and scale	Duration	Frequency	Magnitude	Sensitivity	Significance	Mitigation strategy (actions defined in ESMP)	Residual significance after mitigation
14.2 Vibration disturbance causes stress and damage to buildings, either from trucks and machines on construction sites and access tracks, or from quarry operations.	Direct	Towns in road corridor	Project duration	Frequent	Small	Medium	Minor	Prevention and reduction	Negligible

6.1 Summary of Involuntary Resettlement Impact

Involuntary resettlement and land acquisition resulting from project activities are expected to have immense and direct negative impact on people along the corridor through the loss of properties, farmlands, crops, and income generating sources. The ESIA and the RAP has identified that an estimated 400 persons will be physically displaced by the project, and 99 residential structures will be affected, including 58 structures that are used for both residential and business purposes. A total of five farms, a church, four graves, and six wells and handpump will also be affected. The RAP provides detailed measures for mitigation these impacts.

6.2 Detailed Discussion of Positive Impacts

6.2.1 Employment Opportunities

The construction of the Putuken to John Davis Town road will create employment opportunities both directly or indirectly during construction and operational phases. Socioeconomic study infers that there are a lot of local human resources. Therefore, most people will be employed as skilled and unskilled workers. Few skilled workers will be available. It is anticipated that approximately 200 people will be employed directly and indirectly during the project period.

During the construction phase, the proposed project, upon implementation will directly employ as a minimum the following groups:

1. Supervising engineering team;
2. Contractor's staff (managerial, skilled and unskilled labour force);
3. Suppliers of plant, machinery, materials and essential services;
4. Construction monitoring personnel from the various Government agencies; and
5. Skilled, semi-skilled and unskilled labour force.

6.2.2 Improved Local Socio-economy

The communities acknowledged that the project road will contribute to the growth and development of the local economies of the two (2) counties. The following are socio-economic benefits expected:

- Increased business opportunities at the market centers due to the presence of the project workforce during construction;
- Employment of locals during the construction phase of the project;
- Strengthening of local economy through the establishment of micro-enterprises

such as bulking points, catering services etc.

6.2.3 Ease of Road Transport in the Project Area

Construction of the proposed road will improve transport and communication in River Gee and Grand Gedeh Counties area because of improved road surface. After construction, the road will improve transportation of goods and services to and from the project area. This is a large positive impact.

6.2.4 Improved Living Standards

The implementation of the project will result in the improvement of the living conditions of population living along the road and the two counties in general, thus contributing to poverty reduction.

The communities felt that the journey time will be shortened and there will be improved access to markets to sell their produces. Both male and female felt that the upgrading of the road will result in efficient traffic flow with savings in both time and cost. There will be improved communication, which at present is a big challenge.

6.2.5 Increased Security

The area where the road traverses is neighbouring an area largely peaceful. However, incidents of theft do occur along the way due to the scarce road users at present. Better road usage with frequent passers-by would result in an improvement of security. The

upgraded road will also increase movement of security personnel. Any improvement in security from the current levels would be a major benefit to the communities.

6.2.6 Education

Better road communication would open up the area for development, which would also lead to building of more schools and other advance institutions of learning. This would eventually lead to improvement of education institutions in the area. Any improvement in educational attainment from the current levels would be a major benefit to the communities.

6.2.7 Improved National Transport

The main mode of transportation in the area is road transport, which is used for transportation of passengers and goods to the various town centers along the project area. There are no other affordable options for transport in the project area. With improved road conditions, it is expected that there will be improved transport within the region. This is likely to benefit the local economy and subregion as a whole. There will also be easy access to the essential services offered in the neighbouring towns and cities.

6.2.8 Road Safety

Road projects can lead to reduction in accidents when they involve significant improvements in vertical and horizontal alignments, improved carriageway width, junction layout or greater separation of non-motorized traffic and motor traffics.

The proposed project design will contribute to improving road safety and the comfort of road users in several ways:

1. Providing sight distances and visibility
2. Providing road signs (both warning and directional) and road markings
3. Providing guardrails
4. Adequate shoulders.

6.2.9 Empowerment of Women

Women play an important role in agriculture and general economy of the project area. However, the existing road makes it hard for women to access markets for their products due to the high transport costs. Public transport operators are few, as a result, the fares are high. The poor state of the road leads to use of motorcycles and motor vehicles with four-wheel gears. These vehicles are very uncomfortable, gender insensitive and often overloaded and even worse for women who are pregnant. Due to the poor state of the road, it takes very long for women to reach trading centers and hospitals. This will however change with the construction of the proposed road, thus empowering women in these counties.

6.2.10 Improved Drainage

The proposed road is expected to improve drainage infrastructure and general discharge of storm water from the road/carriageway which will reduce soil erosion in the project area. This will be a major gain to the present road condition as there are signs of serious erosions in several places.

6.2.11 Improved Access to Services

Majority of the inhabitants of the project area have difficulty in accessing markets, schools, hospitals, government offices and other amenities. This is due to high transport costs, longer travel time, low economic growth and poor/lack of services due to the poor road network in the area. This will be eliminated with the construction of the road.

6.2.12 Reversal of Rural Urban Migration

Most of the people in the project area have shunned investing in the area and mass exit of human resources especially the youth in search of opportunities and services in urban areas. The road will enhance access to services, markets and stimulate economic activities in the area reducing and reversing rural urban migration which has become a major planning concern in the country.

6.3 Detailed Discussion of Negative Impacts

6.3.1 Impact on Topography

The part section of road between Putuken and John Davis Town passes through few hilly areas with majority of the land covered is swampy land. During widening of the existing corridor there would be cutting of slopes and filling which would change topography at some parts of these sections of the road. Earthworks would alter the existing topography, although the impact would be negligible.

In addition, the project road is passing through a terrain prone to earth flows/mass movement erosion and landslides due to the geological nature of the terrain. Protection measures need to be taken through construction, which might alter the topography at a localized level.

6.3.2 Impacts on Surface Water Drainage

Several streams cross the project road. Apart from these, there are various small drains, and water pans draining the areas along the project section. In the hilly section, there are various valley drainage lines, which cross the project road. Minor impacts are anticipated on the surface water drainage in the area during the construction phase due to the diversion of waterway. Precautions need to be taken during the construction work of culverts and bridges across these streams such that the flow in these water bodies is not obstructed, thus affecting the cross drainage. In addition, any embankment work in low lying areas shall have provisions for cross drainage for natural drains to ensure that flow is not affected during the construction phase.

6.3.3 Impacts on Soil Environment

- ☐ Mass Movement – Erosion

It was observed along the existing road that mass movement erosion is a common phenomenon. Most of these soil movements are small, but the areas affected by mass movements are usually completely destroyed and rendered non-productive for further

agricultural use. Such areas need considerable efforts and investments for reclamation. The loss of fertile land, even if the area is very small, is always a serious drawback for farmers. Among other land use causes, surface runoff entering into these cracks could then cause rapid over-saturation of the surface layers leading to wet earth flow and subsequent slumping of the up-slope part of the crack, thus forming an initial erosion scar.

Because of the evenly distributed rainfall, the soil remains saturated over long periods. Less permeable under layers restrain deep percolation, encouraging lateral water movement and lead to temporary waterlogged conditions. These will cause plastic or even liquid-state conditions encouraging wet earth flow. This tendency will be greatest on steep slopes and may explain why all erosion scars observed in the area are located on convex slope sections.

- Impact on Top Soil

The impact on soil due to the project will be in terms of topsoil erosion. Strengthening and widening of the existing road will not cause significant soil erosion; however, soil pollution would take place to a negligible extent if proper control measures are put in place for spillage of construction material, oil, fuel, grease and asphalt around the construction yards.

Loss of productive soil, during the construction stage, is envisaged at locations of workers' camps, stockyards, storage, etc. if these are located on fertile areas. The contractor should ensure that no productive areas are used for these purposes and avoid adverse impact. In any case, though it would be a direct impact, it would be reversible and insignificant in nature. The soils in the road alignment are of loam to clay loam soils being capable of producing high yields. Soils both within and outside the road corridors may be negatively impacted due to the proposed project.

The loss of productive topsoil due to road construction is a direct adverse long-term impact. Since a major portion of the proposed road is on the existing alignment and do not utilize agriculture land, there will be minimum permanent loss of agriculture soil and land due to

the road construction. In addition to this, there will be temporary impact on productive soil at diversions, and labour camp due to leasing of land for construction period. Hence, the impact on soil during construction phase has to be controlled by strictly implementing the ESMP suggested for the project. During the operation phase of the proposed project roads, no impact on the productive top soil is envisaged.

- Soil Erosion

The soil in the study area varies from loam to clay loam soils. Therefore, the potential for erosion varies along the alignments. Soil erosion will be aggravated if the vegetation is removed since roots are known to hold soil together. This will however be for a temporary duration until the compensatory afforestation and roadside turfing have matured. It will not be possible to widen the existing road without removing small trees and therefore erosion will be unavoidable. Mitigation measures such as turfing of road embankment slopes with shrubs and grasses will take care of soil erosion to a considerable extent. In borrow pits, the depth of the pits should be regulated so that the sides of the excavation will have a slope not steeper than 4 vertical to 1 horizontal from the edge of the final section of bank. The device for checking soil erosion includes the formulation of sediment basins, slope drains etc. Cutting of trees in phases will minimize the impact.

No soil erosion is envisaged when the road is in operation as all the slopes and embankments of the project road shall be stabilized through turfing and pitching.

- Contamination of Soil

Contamination of soil during construction stage is primarily due to construction and allied activities. The sites where construction vehicles are parked and serviced are likely to be contaminated because of leakage or spillage of fuel and lubricants. Pollution of soil can also occur in hot-mix plants from leakage or spillage of asphalt or bitumen. Refuse and solid waste from labour camps can also contaminate the soil. Contamination of soil during construction might be a major long-term residual negative impact. Unwarranted disposal

of construction spoil and debris will add to soil contamination. This contamination is likely to be carried over to water bodies in case of dumping being done near water body locations.

However, by following mitigative measures such as maintenance of vehicles and machines and fuel refilling in a confined area, contamination of soil can be avoided to a great extent. The provision for oil interception chamber is suggested in the ESMP for treating the waste water generated from vehicle washing, refilling and maintenance areas. Fuel storage and refilling sites should be kept away from cross drainage structures and important water bodies. All unwanted waste materials shall be disposed of as desired and the site shall be fully cleaned before handing over. These measures are expected to minimize the impact on soil contamination.

During the operation stage, soil pollution due to accidental vehicle spills or leaks is a low probability but potentially disastrous to the receiving environment, if they occur. These impacts can be long term and irreversible depending upon the extent of spill. The nearest cities should have fire fight facilities in order to meet the risks during the operation phase of the highways.

6.3.4 Impacts on Water Resources Environment

- **Impact on Surface Water Quality**

The proposed road corridors are not expected to alter the existing water quality on a permanent basis. There are various water bodies, along the corridors including rivers, backwaters, and streams. Some impacts are anticipated on the water quality of these water bodies during the construction phase. Silt load in the streams at the culvert and bridge locations may increase during construction and the spillage of hazardous chemicals during accidents may pollute the waters thereby, affecting the ecosystem. The issue of blocking of cross drainage should be taken care throughout the project stretch. Care needs to be taken during the construction of culverts and bridges. In case of any water supply system at the downstream of the bridge location, prior information should be made to the concerned

towns and villages and the construction activities should avoid discharge of any hazardous chemicals in to water system.

Degradation of water quality is also possible due to accidental discharges into watercourses from drainage of workers' camps and from spillage in vehicle parking and/or fuel and lubricant storage areas. However, mitigation measures such as construction works close to the streams and other water bodies shall be avoided, especially during wet seasons.

Disposal of waste arising from the project activities should be done by approved waste disposal agents and collecting and storing of bituminous wastes and taking it to approved disposal sites will minimize the impact.

During the operation phase, the possibility of degradation of water quality is very remote. The impact on the surface water quality during operation can be expected due to accidental spillage. However, the probability of such accidents is minimal since enhancement of road safety measures such as improvement of curves and widening of the roads and other pedestrian facilities are taken care of in the design stage.

- Impact on Ground Water Quality

No activities of the project construction or operation are expected to have any impact on the ground water quality of the region and hence the impacts on the ground water quality are not anticipated.

6.3.5 Impacts on Air Environment

Vehicular emissions are one of the major sources of air quality impacts of highway projects. As the project envisages improvement of road conditions for smooth traffic flow, the project will have beneficial impact on air quality of the region during its operation. However, when viewed with respect to the existing ambient air quality or with respect to compliance of ambient air quality standards during the post upgrading phase of the road stretch, due to the increase in the traffic volume, the impact on air quality along the project roads is likely to be minor. Impacts on air quality during the

construction phase of the project will be considerable as the amount of work involved in improvement of the road is significant, but any possible impacts will be temporary. However, provision of adequate air pollution control equipment, like dust filters and measures like dust suppression by water sprinkling and planting of green belt may further help to significantly reduce the impact. Emission of CO_2 and NO_x due to the combustion of diesel will be a principal cause of air pollution during the construction phase.

After improvement of the existing road, the traffic is expected to move smoothly at higher designed speeds, which will assure lower emissions of gaseous pollutants, further improving air quality in the region and hence not expected to affect the air quality adversely. However, the extent of these impacts, at any given time will depend upon the rate of vehicular emission within a given stretch of the road; and the prevailing weather conditions. The impacts will have strong temporal dependence as both of these factors vary with time. The temporal dependence would have climatic, seasonal, as well as long-term components.

6.3.6 Impacts on Ambient Noise Level

During the construction phase of the road, the major sources of noise pollution are vehicles transporting the construction material to the construction yard and the noise generating activities at the yard itself. Mixing, casting and material movement are primary noise generating activities in the yard and will be uniformly distributed over the entire construction period. Construction activities are anticipated to produce noise levels in the range of 80 - 95 dB (A). The construction equipment will have high noise levels, which can affect the personnel operating the machines. Use of proper Personal Protective Equipment (PPE) such as earmuffs will mitigate any adverse impact of the noise generated by such equipment.

The noise likely to be generated during excavation, loading and transportation of material will be in the range of 90 to 105 dB (A) and this will occur only when all the equipment operate together and simultaneously. This however is a remote possibility. The workers in general are likely to be exposed to an equivalent noise level of 80 to 90 dB (A) in an 8-

hour shift, for which all statutory precautions should be taken into consideration. Careful planning of machinery selection, operations and scheduling of operations can reduce these levels.

As the project road passes through populated areas at cities, towns and villages centers, people in these places will be exposed to the high noise levels. To avoid significant impacts on human health, it is recommended to avoid construction work at these sections during night times and ensure that only minimum required machinery is deployed on the site. Uninterrupted movement of heavy and light vehicles at high speeds may cause increase in ambient noise levels on the project road. It may have negative environmental impacts on the sensitive receptors close to the project road.

6.3.7 Impacts on Fauna, Flora and Ecological Environment

- **Impacts on Fauna and Flora**

The increased activities of vehicle movement disturb the sensitive movements of fauna. The impacts are expected to be more severe during the times of accidents of vehicles carrying hazardous chemicals. In the absence of proper accident management mechanisms, such accidents will be very hazardous to flora and fauna of the region. Some sections of the proposed upgrading of the road to asphalt standard are near forest areas. From the site visits and discussion with officials, it is inferred that there are no noticeable habitats or wild or endangered animal habitats along close vicinity of the project road. This can be inferred due to the presence of farmlands and human settlements along existing roads. But upgrading of the road will result in increased human activities along the project area. Further, noise due to construction machineries and increased vehicular movement for raw material transportation for road construction will disturb the fauna along the area during construction phase. Due care should be taken in the construction stage that human activities should be completely restricted to the proposed road corridors such that there should not be any human ingress in to forest areas for poaching of animals / any other natural features.

- Impact on Ecological Resources

The road passes near forest areas. These areas are rich in biodiversity as presented in base line environmental profile of the project road. The envisaged borrow pits and land acquisition in the project road will bring about hill cutting and tree cutting. This would have a substantial, irreversible, and long-term impact on the flora and fauna of the project area.

Also based on the exercise conducted, it was observed that that there is no endangered flora / fauna in the project influence area and hence the impact of the loss of vegetation will not be very severe. Cutting of few large trees is envisaged along both sides of the project road. Trees have to be cut down along the proposed road corridors. After completion of the project, the trees will be replanted along the road corridor with consideration on:

i. Minimizing the impacts of loss of vegetation by limiting the number of trees to be felled where possible.
ii. Adequate care of the compensatory plantation should be taken up so as to achieve over 90% survival rate.
iii. Landscaping should be done with a lag of 3 to 4 months from the start of the work on any section. The section should be deemed to be complete when the landscaping is over.
iv. Survival rate of plants must be included in the contract specifications so as to ensure that the compensatory plantation achieves the objective of replacing cut trees.
v. Indigenous and endemic tree species suitable for the area should be planted at the onset of the wet season. The plants should be provided with adequate protection from animals and proper monitoring should be carried out to ensure their growth.

6.3.8 Impacts on Human Use Values

- **Land Acquisition**

The proposed upgrading of the project road will involve land acquisition and demolition of road side structures. A detailed analysis of the impacts of land acquisition and structures in the project area are part of a RAP already undertaken. The project area runs through peri-urban areas, and hence the impact of land acquisition is expected to have a significant effect on the livelihood and economic activities of the project area.

- **Construction of Site / Camp Buildings**

This activity will involve construction of buildings for office, construction camps and habitation during the construction phase. This may result in clearing of vegetation, which poses sanitary & health problems in the construction camps. Due care should be taken to maintain hygienic conditions at site by providing proper drinking water and sanitation facilities.

However, the impact due to such activities is reversible and short term.

- **Impact on Land Use**

The land use along the project road is expected to experience a change due to increased economic activities after project completion. Characteristics of areas of major concern for impact mitigation along the project road include the following:

Settlements – As described earlier, there are various settlements and few peri-urban areas along the project road. After the proposed upgrading, some of the structures will be very close to the road thereby creating safety concerns for the people. Similarly, a number of schools and churches are located along the section of the road, which would get affected due to increased vehicular movement and speed. Also, ribbon development might take place along the project road due to the ease in traffic movement.

Rivers / Streams – There are several small rivers/streams along the project road, which might get contaminated owing to the project activities both during and after construction. Field investigations showed that any activity that obstructs the natural flow of the streams could lead to flooding problems.

6.3.9 Climate Intervention in the Project Road: Paving of Putuken to John Davis Town (50Km)

Climate change resulting from human activities is now recognized as one of the most pressing environmental issues facing the world's population. In addressing this problem, governments, the international community, and industry are moving to control emissions of greenhouse gases (GHGs), setting targets such as those agreed at the Kyoto Conference in 1997. These moves will continue in the future and, inevitably, businesses and other organizations will increasingly have to account for and report on GHG emissions.

Although environmental reporting is increasing generally, there is no accepted standard measurement protocol for GHG emissions. Companies and organizations have developed their own methodologies producing results which have limited use for benchmarking purposes. It is therefore difficult for companies and shareholders to accurately assess the success of their emission-reduction policies in relation to those of competitors. Companies and other organizations now need a way to assess their own contribution to climate change in terms of GHG emissions, and that – on a wider scale – a standard method is needed to allow comparison of the effectiveness of measures and policies introduced at the organizational, national and international levels. These are the needs which the GHG Indicator addresses. By applying the methodology contained in these guidelines, individual companies and other interested organizations can derive GHG Indicators to quantify climate change impact. By adapting the guidelines to their own specific situations, governments and other institutions can use them to provide a widely accepted and established way of assessing such impacts.

Transport contributes almost a quarter of global energy-related carbon dioxide (CO2) emissions. Today, most CO2 emissions from the sector are from road transport in developed countries. However, vehicle emissions in developing countries are growing due to rapid motorization. The International Energy Agency's World Energy Outlook 2013 projects that transport fuel demand globally will grow nearly 40% by 2035. Environmental sustainability is a pillar of Strategy 2020, the corporate strategy of the African Development Bank (AfDB). In the transport sector, ADB's Sustainable Transport Initiative Operational Plan, approved in 2010, makes addressing climate change a priority. Recognizing the importance that the operational plan attaches to incorporating impacts of climate change, ADB staff need to be able to quantify the implications of transport projects for greenhouse gas (GHG) emissions,3 so that these can be considered in the project design and approval process.

However, this project was also screened using the Climate Safeguards System (CSS) of the African Development Bank and found to be a Category 1 Project. In terms of climate change and green growth, the project will contribute immensely to climate change resilience through improved road network, biodiversity management, agricultural production, better land use programme and good air, water and land management practices. The project will also enhance climate change resilience through improved storage, warehousing and camps facilities and also improved marketing systems. Moreover, efforts should and will be made to seek additional resources that may be used to enhance the effectiveness of this project by implementing climate change adaptation measures such as sustainable transportation, long-term adaptation measures in especially affected areas and communities leading to a reduction of expected socio-economic losses. Such activities will include: (i) sustainable land use practices; (ii) terracing to minimise topsoil losses through erosion; (iii) agroforestry or grassing/planting of native tree or roadsides and quarry/borrow pits areas, initiatives that will improve soil fertility; (iv) development of

sustainable green infrastructures; (v) provision of good seasonal crop seeds that can grow in both rainy and dry seasons; and, (vi) capacity building programs.

- Climate mitigation and adaptation

The project is unlikely to directly cause material greenhouse gas (GHG) emissions. Emissions will arise from transport and construction of proposed 50Km road and facilities such as contractor and engineer camps, storage areas, access roads, or similar activities. In such regard, there will be limited scope for project-based mitigation. However, by improving the road, land, water management and agricultural production systems, the project will directly decrease the overall GHG emission efficiency of the road in the southeastern regions of the country. The project will, therefore, directly assist Liberia to adapt to changing climates by constructing a sustainable road network.

- Climate Finance

This project is analysed and considered to be contributing significantly to climate change adaptation and will contribute to the Bank's climate adaptation finance target. The project will contribute as much as 100% climate financing from its financing or more. It was noted, however, that the project, as currently proposed, does not have adequate resources to address environmental and climate change challenges such as through soil and water conservation measures (including terracing, grass planting or agro-forestry activities, water harvesting and storage). As such it is important that more efforts be put in to get additional resources either as co-financing to the project or just as independent project activities within the target areas to address the challenges.

- Basis for calculating a GHG Indicator

There are two main contributors to a company's GHG emissions: energy-related emissions and process-related emissions. Together they represent a very high proportion of the global warming contribution of normal business activities. To derive the GHG Indicator, they are assessed and calculated separately, then aggregated. The aggregated GHG value is then

normalised using a measure of business activity. Normalisation is essential as it this step which allows inter- and intra-company comparison. The methodology used to derive the GHG Indicator is based on fundamental research by the IPCC (1996a) for calculating the global warming potential of chemical species. The key to the model is the conversion of all relevant emissions to the IPCC reference gas (carbon dioxide); emissions are also referred to as carbon dioxide equivalents. To date, the IPCC work is the most scientifically and politically acceptable. It also allows for the combination of energy-related emissions and process-related emissions into a single metric

- Transport-Related Emissions

Emissions from transport are broken down by transport mode. Based on data that a company might reasonably be expected to collect, these guidelines consider: Road Vehicle transport !"Non-Road transport data should include all transport by the company for either road work activities and should cover transportation of goods and company personnel by all transport modes covered below. Transport data for commuting to the work place should not be included in the calculation. Non-carbon dioxide emissions from transport have not been included for the reasons mentioned. Emissions of gases like N2O and CH4 are very difficult to quantify and their effect on climate change is thought to be much less than that of CO2.

- Where to Obtain Data on Transport Use

Transport data are generally much harder to obtain than fuel data because they are not always kept in house and are handled externally. However, as indicated by the list below, there are potential sources for such data. For companies that tend to use one particular travel agent for business travel, the agent should have records of all the bookings made. Car rental companies should keep records of cars hired or leased and their mileage. Company accounts departments should also have records of claims by employees for mileage travelled in their own vehicles.

Potential sources are:

- Fleet records and invoices
- Employee mileage calculations/claims
- Information from car rental firms
- Tax returns from declarations and fleet monitoring records
- Travel agency invoices and records
- Freight handler invoices
- Company vehicle log books

☐ Fuel Consumption Reduction for Transportation Per Km

When the road is improved, the expected fuel consumption per kilometer is 0.08 liters compare to 0.5 liters per kilometer on bad road or unimproved road.

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The Environmental Social Management Plan (ESMP) is prepared separately for this project (Paving of Putuken to John Davis Town (50Km) hence, is an attached document to this ESIA prepared. It comprises generic mitigation measures which are linked and not link directly to the site.

7.1 Objectives

The Environmental and Social Management Plan (ESMP) is to ensure that the environment and society will be safeguarded during the implementation of the proposed project, in compliance with all technical, regulatory, and institutional requirements. This is the document that must be followed to ensure that identified and potential project impacts are kept within the allowable levels, unanticipated impacts are mitigated at an early stage, and the expected project benefits are realized.

Therefore, the objectives of the ESMP are to:

- Draw together the measures required to mitigate environmental and social impacts, and group them logically into components with common themes;
- Define the specific actions to be taken, responsibilities for these actions, timetables for implementation and associated incremental costs; and
- Describe the arrangements for capacity building, monitoring and resourcing.

The ESMP will be strictly implemented without ignoring any detail.

The ESMP has clearly defined actions, targets and timeframes, as well as precisely allocated responsibilities among the different organisations and personnel working on the project. The ESMP is to ensure the systematic and prompt recognition of problems and the effective actions to correct them.

Briefly, the execution of an ESMP is to facilitate the efficient implementation of mitigation measures to minimize impacts, prevent accidents and maximise the effectiveness of construction, in a context of good management and information sharing among project personnel.

7.2 Project Activities

7.2.1 Design Phase

The design phase includes the following activities:

- Surveying
- Geotechnical Investigations
- Design of pavements
- Design of other structures

The design phase includes mainly design activities. However, some on-site activities will also be carried. These include, but are not limited to:

- Measuring activities, during topographical surveying;
- Collection of sub-grade and soil samples from test pits as well as some in-situ testing of some samples, during soil surveys;
- Geotechnical explorations at quarries and borrow pits;
- Pegging, borehole drilling and rock core sampling, if rocks were found, in the locations where new bridges are to be constructed.

7.2.2 Construction Phase

The construction phase will include mainly the following activities:

- Construction of offices and residential premises
- Vegetation clearing along the RoW;
- Earthworks: strengthening and widening of the embankment or cut formations;
- Installation of borrow pits, quarries, crushers, hot mix plants, concrete batching and wash plants;
- Construction and installation of culverts and drainage works;

- Construction of the asphalt carriageway and shoulders;
- Construction and rehabilitation of bridge: reinforcing concrete approach slabs for existing bridge, construction of guardrails over embankments and approaches to bridge, and construction of new bridge;
- Desilting of existing drainage lines;
- Slope protection;
- Quadrant pitching;
- Ancillary works such as road lane marking and installation of traffic sign boards.

7.2.3 The Operation Phase

This phase is not covered by this ESIA and ESMP. Following the completion of the construction phase, the highway will be operated under an Operate, Maintain and Transfer arrangement. Details of the activities, environmental impacts and mitigation measures for this phase, are covered by different project documentation.

7.2.4 Project Participants

Project participants are the following:

- The African Development Bank,
- The Project Financial Management Unit (PFMU) under the Ministry of Finance and Development Planning (MFDP), which is responsible for the project's financial management
- The Project Implementation Unit (PIU) under the Ministry of Public Works, which is responsible for the implementation of the project in terms of technical matters and procurement. The PIU will have an Environmental and Social Officers . The PIU will appoint a private sector company to implement the project.
- for the actual upgrading of the road who will have the required environmental and social protection officers and at least three Community Liaison Officers;

- The Environmental Protection Agency (EPA), which is the regulator that provides the necessary environmental permits and makes sure that the project abides by the national regulations.
- The Grand Gedeh and River Gee Counties local authorities, which include the Superintendent, the Assistant Superintendent for Development and the County Inspector as well as the district level authorities. It also includes the Counties Engineers, who are the representative of the Ministry of Works and Transport.

7.3 ESMP Components

The ESMP is designed as a cover-all, one-stop mitigation and monitoring plan for all social and environmental impacts. As such, it incorporates elements of a range of possible sub-plans which, in some ESMPs, are listed separately. In this ESMP, the sub-plans are combined into a single entity. This makes both management and monitoring simpler, and ensures that there are no gaps between the different safeguard elements.

This ESMP therefore works through a series of different subject elements. These are listed below as 14 headings under four categories of safeguard. The potential impacts identified in the ESIA are listed under these headings, so that each aspect of environmental and social protection can be easily found among the mitigation and monitoring tables. Overlap is removed by allocating impacts to only one heading. This problem arises because some environmental impacts become impacts on communities and the surrounding environment.

The safeguard categories and impact mitigation headings are as follows.

Overall safeguards

1. General Environmental Protection *Protection of society*
2. Environmental Health and Safety
3. Occupational Health and Safety

4. Community Impacts Management
5. Traffic Management
6. Cultural and Archaeological Heritage Management

Pollution control

7. Hazardous Materials Management (including Spill Contingency and Emergency Response)
8. Construction Materials Management
9. Waste Management *Environmental safeguards*
10. Soil Erosion Control
11. Water Resources Management
12. Air Emissions Management
13. Ecological Management Plan
14. Noise and Vibration Management

7.4 Impacts and Mitigation Measures

7.4.1 Appropriate Mitigation for the Identified Impacts

The impacts identified in the ESIA are listed in Table 12, along with the appropriate mitigation measures, the mitigation costs and the residual impacts that may still occur after mitigation measures are applied or because of the mitigation measures themselves.

Table 19: Environmental Mitigation Table

environmental impact	Mitigation measures	Residual environmental impact	Resources required or approximate costs
1. General environmental Protection			
1.1 General environmental damage in the form of degraded land, lowered quality of living, reduced quality of resources, etc.,	• Avoid damage to any part of the environment (soil, plants, animals, human resources and settlements) as far as possible. • If damage cannot be avoided, then mitigate or compensate for the damage. • Avoid any work beyond the agreed boundaries of the work sites. • Agree on mitigation or compensation arrangements before starting any work. • Do not hide any damage or pollution. In the event of an accident, it is better to consult the EPA and agree on a mitigation plan than to risk prosecution under the law.	Negligible	Not applicable: this category should be covered by the design process and by responsible contract management.

1.2 Limited awareness or respect about the importance and value of the environment among labour force leads to an excessive amount of	• Ensure that the site supervisors brief all workers at the start of every job, and at the beginning of each week, on the main environmental messages. • Ensure that all professional and technical staff respect the environment and understand why they must. • Do not allow staff and workers to neglect	Negligible	Appropriately prepared and targeted training materials on environmental and social awareness for managers, site supervisory staff, machine operators, drivers and workers. These will include the environmental
damage to resources or disruption of people's livelihoods in the roadside areas of the affected communities	environmental issues. This may lead to offences under the Environment Protection and Management Law. ◇ Do not ignore blatant disregard for environmental and social issues by professional and technical staff.		and social components of the weekly and daily site toolbox talks. 3 person months of a national consultant to create these materials and conduct initial trainings. Subsequent cascaded trainings and toolbox talks to be undertaken by the Contractor and MPW.
2. Environmental Health and Safety			

2.1 Injuries occur to the public, especially children, during works in the affected communities along the road.	• Ensure full separation of the public from working sites. • Fence off working areas so that people cannot be injured by things dropped on them or falling into excavations. • Maintain a clean site so that dangerous articles are not left lying around near the work site, especially at night.	Negligible	3 x community safety awareness days per community (affected) by a national NGO providing community theatre.
2.2 Injuries occur to the public from exposure to hazardous substances (e.g. cement, diesel) in the affected communities along the road.	• Ensure full separation of the public from storage facilities. • Enforce the exclusion of non-project personnel from all sites with hazardous substances.	Negligible	Not applicable. Awareness of the importance of implementing exclusion will be included in awareness trainings. Costs are then implicit in contract implementation.
2.3 Infectious and contagious diseases are spread amongst the affected communities near the road.	• Ensure that non-local workers are accommodated in sound, dry buildings, with good ventilation and clean water supplies, and with good cleanliness and sanitation arrangements. • Provide bed nets to all non-local workers. • Monitor and control the habitats of malaria vectors.	Negligible	Health training as part of toolbox talks (see above).

	• Provide awareness trainings to workers and nearby		
	communities, on the prevention of contagion and infection from diseases such as influenza, Ebola, sexually transmitted diseases and HIV. ◇ Encourage workers to abstain from sex with local people, or to use suitable protection such as condoms.		
2.4 Sexual exploitation and gender-based violence increase in local communities, particularly the affected rural towns due to the influx of temporary laborers	• Issue policy statements on the project's adherence to Liberian law regarding sexual exploitation (including minors and prostitution) and genderbased violence. • Maintain a zero tolerance punitive regime among all project and contractors' staff and workers. • Include awareness raising on these issues in trainings and site briefings.	Negligible	Trainings with County Ministry of Gender programme on GBV / SEA.
3. Occupational Health and Safety			

3.1 Workers are unaware of the dangers from the sites (roadline, quarries, batching plants etc.) they are working in, leading to high rates of injury.	• Ensure that workers are given safety inductions, toolbox talks and full daily and weekly briefings. • Develop a culture of admonishment for unsafe acts. • Obligate managers to set good examples for respecting safety on site.	Negligible	Covered under the same programme as for 1.2 above.
3.2 Injuries due to inadequate provision of safety equipment	• Provide all workers with safety equipment appropriate to the work that they are doing. • Do not allow workers on to a site unless they are wearing the appropriate safety gear. • Keep first aid kits on all work sites and ensure they remain stocked and all items are in-date. • Ensure that there are two people on each work site who know what to do if there is an accident and how to use the first aid kit.	Negligible	Provision of the minimum set of safety equipment per worker (helmet, high visibility waistcoat, boots, gloves and goggles. Ear protection for workers in noisy locations. Training in the use of PPE to be covered in the programme for 1.2 above.
4. Community Impacts Management			

4.1 Incoming workers do not respect local communities, leading to social disruption, particularly in the affected rural towns.	• Ensure that the site supervisors brief all workers at the start of every job, and at the beginning of each week, on the main messages regarding respect for the local communities. • Ensure that all professional and technical staff respect the local communities and behave well. • Do not ignore blatant disrespect for communities by professional and technical staff.	Negligible	Covered under the same programme as for 1.2 above.
4.2 Houses are lost in the road right of way.	• Pay the full and fair compensation as agreed following the procedures given in the Resettlement Action Plan. • Assist the affected persons to relocate and reestablish their lives and livelihoods. • Do not allow any work to commence on a site before full resettlement compensation has been completed.	Affected families should end up at least as well off, with fully restored livelihoods, but emotional trauma may remain.	Resources and costs are covered in the Resettlement Action Plan. Estimated resettlement costs are about US$717,650.48 for properties, including landlords and tenants (but mostly owner-occupiers).
4.3 Loss of land use and business sites in the road right of way, particularly in the three cities.	• Pay the full and fair compensation as agreed following the procedures given in the Resettlement Action Plan. • Assist the affected persons to relocate and reestablish their livelihoods.	Negligible. The Resettlement Action Plan includes provision for full livelihood restoration.	Resources and costs are covered in the Resettlement Action Plan. Estimated livelihood replacement costs are about US$16,800.00

	• Do not allow any work to commence on a site before full compensation has been completed.		
4.4 Cultivated land and crops are disturbed or destroyed, mainly in the rural areas along the road and in the locations chosen for quarries, borrow areas, camps, batching plants, etc.	• Avoid the use of cultivated land wherever possible. This includes fallow agricultural land, rubber and other tree plantations. • Where use of such land is required, check with the CLO at last four weeks prior to commencement of activities (ideally earlier) that mitigation measures have been agreed and implemented. • Do not start using cultivated land before the occupier has fully agreed the compensation strategy, all amounts have been paid and this is confirmed by the CLO.	Reduced agricultural productivity in the area. Affected families may take time to recover livelihoods.	Resources and costs are covered in the Resettlement Action Plan. Estimated compensation costs for economic crops in the road right of way are about US$16,926.75

	◇ Avoid damage crops or land beyond agreed boundaries.		

4.5 Local people's livelihoods are adversely affected by project activities.	• Establish an equitable and fair employment strategy. Liaise with the CLO to ensure that it is understood in the local communities (i.e. that it is transparent). • Give priority to local men and women in labour crews, and those who used to earn livelihoods on land in the RoW. • Pay the usual accepted County wage rates. • Do not demand unpaid work by local farmers or others.	Affected families may take time to recover livelihoods.	Resources and costs are covered in the Resettlement Action Plan
4.6 Cumulative losses are incurred by social groups unable to respond to change.	• Give priority to local men and women in labour crews, and those who used to earn livelihoods on land in the RoW. • Maintain an active policy to ensure gender equality and opportunities for vulnerable groups. • Pay the usual accepted County wage rates. • Do not demand unpaid work by local farmers or others.	The Resettlement Action Plan includes provision for support to vulnerable groups, but sometimes economic support is inadequate.	Resources and costs are covered in the Resettlement Action Plan.
5. Traffic Management			

5.1 Use of public roads by project vehicles increases the accident rate and generates nuisance levels of dust: mainly the Putuken-John Davis Town road, but also between it and other project infrastructure (camps etc.) and Monrovia.	• Minimise vehicle movements. • Enforce transport rules and regulations rigorously. • Conduct driving safety awareness campaigns. • Do not tolerate any poor behaviour, dangerous driving or even minor traffic infringements by any staff or sub-contractors. • Do not allow dust generation to affect the ambient air quality outside the site. • Spray dust suppression water as required, but ensure it is not applied at such rates that it causes erosion and washing out of the roads.	Risk of road accidents will always remain.	Appropriately prepared and targeted training materials on driving safety and mitigation of impacts from trucks and machines for managers, site supervisory staff, machine operators and drivers. 1 person month of a national consultant to create these materials and conduct initial trainings. Subsequent cascaded trainings and toolbox talks to be undertaken by managers.

5.2 Increased traffic on public roads, running at faster speeds, leading to more accidents and more serious accidents: on sections of the Putuken-John Davis Town road as they are	• Maintain strict transport rules and regulations. • Undertake community safety awareness campaigns. • Undertake regular driving safety awareness campaigns to ensure safe driving. • Maintain close liaison with Liberian National Police traffic control units.	Risk of road accidents will always remain.	To be covered during completion.

completed during construction.			
6. Cultural Heritage Management			
6.1 Cultural sites are damaged, anywhere that new land is cleared, such as for diversions, camps, quarries and borrow areas.	• Check with local people, through the CLO, as to whether any activities will affect sites of cultural or religious importance. • Avoid any works where cultural sites might be affected, as far as possible. • If an unexpected archaeological site is discovered, use the chance find guideline • If damage to cultural sites cannot be avoided, agree compensation measures with the local community, through the CLO.	Negligible	Allow for one chance find investigation,
7. Hazardous Materials Management			

7.1 Pollution to air, soil or water and danger (illness or injury) from the delivery and handling of hazardous materials (including bitumen, mixed asphalt, fuels, lubricants and cement) at project camps, workshops, plants and construction sites.	• Follow the hazardous materials management guidelines fully. • Use the safest available transportation option. On roads, use convoys with accompanying support. • Deliver only to prepared locations. • Maintain supplies of spill kits and granules in all vehicles and at all offloading locations. • Ensure competent drivers and close supervision. • Provide emergency training to all personnel involved in the movement and handling of hazardous materials. • Use international labelling for identifying	The risk of accidental leakages or spills will always remain.	Appropriately prepared and targeted training materials on hazardous materials and waste handling and management for managers, site supervisory staff, machine operators, drivers and workers in stores, workshops, refuelling stations, camps, etc.
	hazardous substances. ◇ Maintain emergency response / fire-fighting teams trained for a spillage event and appropriate equipment at each facility.		

7.2 Pollution to air, soil or water and danger (illness or injury) from fuel and oil storage at project stores and workshops.	• Follow the hazardous materials management guidelines fully. • Only use the designated storage areas, with bunding of 150% volume of total capacity. • Only use facilities located down gradient of public water supply boreholes and distant from watercourses. • Ensure that there are retention systems, including walls, bunds and lined drains to contain any spillages. • Ensure that there is hard standing, with a drainage system that includes oil/water separators. • Ensure spill kits and granules are available, and if used, dispose of waste appropriately. • Check facilities, safeguards and procedures for any potential for explosions to occur. • Maintain emergency response / fire-fighting teams trained for a spillage event and appropriate equipment at each facility. • Provide training for all personnel handling fuel and oil. • Take rapid action if uncontained spills and leakages to occur, to prevent soil, and ground and surface water contamination	The risk of accidental leakages or spills will always remain.	Covered under the same programme as for 7.1 above.

	• Do not allow soils to become contaminated and effectively sterilised, or for water courses to be affected by runoff carrying toxic substances, affecting community water supplies, aquatic biodiversity and wildlife. • Have controls in place to minimise opportunities		

	for fuel pilferage.		
7.3 Pollution to air, soil or water and danger (illness or injury) from refuelling operations at project camps, workshops, plants and construction sites.	• Follow the hazardous materials management guidelines fully, which include procedures for refuelling vehicles and site plant. • Spill kits are to be carried by all refuelling vehicles. • Refuel vehicles only on impermeable hard standings with controlled drainage (traps and interceptors). • Plant refuelling on site is to be carried out according to strict protocols for refuelling in unprotected areas. • Enforce the reporting system for spillage incidents.	The risk of accidental leakages or spills will always remain.	Covered under the same programme as for 7.1 above.
7.4 Pollution to air, soil or water and danger (illness or injury) from concrete and asphalt batching plants	• Follow the hazardous materials management guidelines fully. • Use of cement, ready-mix concrete, asphalt, etc. at plants is to be carried out according to strict protocols. • Enforce the reporting system for spillage incidents.	The risk of accidental leakages or spills will always remain.	Covered under the same programme as for 7.1 above.
8. Construction Materials Management			

8.1 Damage to the land from borrow pits and quarries	• Identify borrow pits and quarry areas as early as possible, and conduct specific impact assessment and mitigation on these areas. • Allow adequate time for the consultation, resettlement and compensation of people whose land is affected. • Ensure that only the approved borrow pits and quarries are used. • Install sediment control measures to prevent runoff from causing contamination and siltation of water bodies. • Take appropriate measures to prevent emissions and dust from affecting the ambient air quality outside the immediate site boundaries.	Land surfaces can never be fully restored following extraction, but revegetation can be undertaken to begin the process of ecological restoration.	Appropriately prepared and targeted training materials on the management of quarries and borrow areas for managers, site supervisory staff, machine operators, drivers and workers in these sites. These will include the environmental components of the weekly and daily site toolbox talks for these areas.

	• Ensure proper geotechnical management so that excavation and tips do not trigger slope instability. • All road construction-related activities are to be covered by the detailed, site specific and project specific components of the ESMP.		

8.2 Disturbance and danger from quarry operation – general	• Ensure that only the approved quarry areas are used throughout the re-opening and operation period. • Ensure quarry plans include drainage assessment and water management controls, to prevent the contamination and siltation of water bodies. • Maintain the quarry area in a clean, safe and efficient condition. • Ensure proper geotechnical management so that excavation and tips do not trigger slope instability. • Take appropriate measures to prevent excessive noise and emissions from crushers at road material quarries. • Rehabilitate the quarry to a fully stable and vegetated condition after work has ceased.	The risk of accidents is always present in quarries, even with good management systems in place.	Covered under the same programme as for 8.1 above.

8.3 Disturbance and danger from quarry operation – explosives and blasting	• Obtain formal licensing from the government. • Abide by Liberian laws and regulations, and UNMIL guidelines, regarding the handling, storage and use of explosives. • Be particularly strict in enforcing safety regulations when using explosives. • Follow the detailed specifications for blasting provided in this ESMP. • Ensure that quarry blasting does not create excessive noise and vibration disturbance to wildlife and communities. • Do not allow any unauthorised person to have access to explosives. • Do not allow anyone to use welding equipment,	The risk of accidents is always present when using explosives, even with good management systems in place.	The contractors must employ qualified and certified quarry masters, who must be responsible for compliance with these mitigation measures as part of their job. Additional costs should therefore not be necessary. These provisions should also cover the mitigation of vibrations listed in impact 14.2 below.
	smoke, cook food or light any fire within 50 metres of an explosives store.		
9. Waste Management			

9.1 Pollution of soil or water and ill-health from waste generation and management at camps and construction sites.	• Operate a waste management strategy based on principles of reduction, recovery, recycle and reuse. • Collect and segregate waste into hazardous and non-hazardous at the source. • Avoid waste spills during storage and handling. • Dispose of all waste in an appropriate manner. • Conduct recycling and waste reduction campaigns. • Ensure use of PPE by staff when handling all forms of waste. • Ensure that waste collection, segregation, storage and disposal systems avoid environmental degradation, contamination, and hazards to human and animal health. • Do not allow an increase in disposable income among employees to create more waste, both quantity and type, without challenging perceptions.	Negligible	Covered under the same programme as for 7.1 above.

9.2 Pollution of soil or water and ill-health from waste disposal at camps.	• Dispose of wastes in the most environmentally sound manner possible. • Never burn waste, creating air pollution. • Dispose of wastes to EPA-authorised facilities. • If there are no alternatives, design and construct a landfill site that is lined and to international standards. This should be in an area that is not prone to slippage, cannot leach to surface water and groundwater, and is a suitable distance from settlement. It should be located down gradient of any water supply boreholes. • Ensure that the landfill site is in a secure compound and that its operation conforms to international standards.	Negligible	Covered under the same programme as for 7.1 above.

	◇ Deal with hazardous waste according to international best practice and EPA guidelines.		

9.3 Pollution of soil or water from poor sanitation at work sites – camps and construction sites.	• Provide proper water closet toilet facilities at all long term (>1 month) work sites. • Do not allow water to run out at toilets. • Maintain all toilets in a clean and sanitary condition. • Provide proper earth pit latrines at all work sites where work will be undertaken for periods of up to one month. • Fill the latrines in once they become full and when site work is complete. • Do not allow site workers to defecate in the open anywhere on the site or in its vicinity. • Add the use of sanitation arrangements in tool box talks	Negligible	Covered under the same programme as for 7.1 above.
9.4 Pollution of soil or water from site camps and stores.	• Ensure that all potentially hazardous materials (i.e. fuel, oil, other chemicals, sewage) are stored or disposed of in appropriate ways. • Devise on-site emergency spillage plans and train staff in their implementation. • Remove all debris and litter from site. • Take active measures to prevent pollution to the soil or water courses.	Negligible	Covered under the same programme as for 7.1 above.
10 Soil Erosion Control			

10.1 Erosion and physical damage of soils and earthworks – all construction sites, camps and ancillary infrastructure areas.	• Only disturb the soil where it is necessary to do so for the agreed works. • Use existing tracks and previously disturbed areas as far as possible. • Do not make access tracks wider or other cleared areas larger than is absolutely necessary. • Do not allow erosion to happen without taking rapid control measures: install erosion and sediment controls as the very first physical site	In an environment of highly erodible soils and intense tropical rainfall, erosion can be reduced to acceptable limits but cannot be stopped entirely.	Appropriately prepared and targeted training materials on the management of earthworks, drainage systems and erosion control for managers, site supervisory staff, machine operators, drivers and workers in these sites. These will include the environmental

	activity. • Grade any newly formed slopes to the minimum angle possible. • Cut slopes to grades appropriate to the material found. • Level surfaces to prevent erosion as soon as works have been completed. • Keep earth piles away from the edges of steep slopes and watercourses. • Allow small plants to grow back on the edges of tracks. • Where it is present, top soil to a depth of 200 mm should be removed and stockpiled for later site restoration use. • Undertake soil erosion and sediment controls as necessary, to protect areas from slips and erosion. All soil slopes steeper than 10° must be revegetated. • Avoid compaction of the soil in temporary use areas by limiting machine and vehicle access. • Deep-rip compacted soil using the tines on a bulldozer at the start of site rehabilitation.		components of the weekly and daily site toolbox talks for these areas. Might also be linked to the programme for impact 8.1 above.
11. Water Resources Management			

11.1 Damage to water resources by pollution with sediment or chemicals in runoff in any of the 11 major creeks and many, minor creeks crossed by the road, or nearby wetlands and water supply boreholes.	• Do not dispose of anything into any kind of water body. • Keep earthworks, tracks and other cleared areas as far as possible from watercourses or bodies. • Where earthworks, tracks, roads and other cleared areas are within 50 metres of watercourses or bodies, take special care to ensure that fuel, oil and other hazardous substances, and any earthworks, are properly contained. • Ensure that all community water supplies are safeguarded. Confirm the location of local water	In an environment of highly erodible soils and intense tropical rainfall, sediment influxes to watercourses can be reduced to acceptable limits but cannot be stopped entirely.	Covered under the same programme as for 10.1 above.
	supplies with the CLO. Be prepared to bring inn clean water for communities where the works have polluted their water sources • Do not extract so much water from a supply that the normal users are short. • Schedule major earthworks only in the dry season. • Use surface protection measures to control soil erosion and protect watercourses.		

	• Regulate water discharge and run off using sediment ponds. • Monitor downstream water quality routinely.		
11.2 Pollution by entrained sediment from poor drainage systems entering any of the 11 major creeks and many, minor creeks crossed by the road, or nearby wetlands and water supply boreholes.	• Provide culverts wherever water needs to flow across the road or an access track. • Ensure water from culverts and other drains is discharged at low energy via drop structures and aprons. • Avoid long gaps between culverts or turnouts, so that a lot of water flow builds up. • Make temporary drains as necessary to avoid waterlogging or erosion. These must be adequate for accumulated runoff water as well as rainfall. • Discharge drains into well vegetated areas. Provide mini silt collection ponds if drains must discharge straight into water courses.	In an environment of highly erodible soils and intense tropical rainfall, sediment influxes to watercourses can be reduced to acceptable limits but cannot be stopped entirely.	Covered under the same programme as for 10.1 above.

	Never allow sediment from bare eroding surfaces to be washed into water courses.		
12. Air Emissions Management			
12.1 Dust from construction sites and access tracks to ancillary infrastructure affects local communities and crops.	• Enforce dust control measures during the dry season. • Enforce strict speed limits on earth tracks by placing speed bumps. • Spray water on to dry earth surfaces. • Stop work in very windy, dry weather. • Fit crushers with water sprays.	Dust can never be totally eliminated, but it can be reduced to acceptable levels.	Covered under the same programme as for 10.1 above.
12.2 Exhaust fumes affect local communities close to the road and all	• Use only vehicles and equipment with engines that comply with national emissions standards. • Maintain engines in good working order.	Negligible	Not applicable. This should be covered automatically through the contractors' good management of its resources.

project ancillary infrastructure.			
13. Ecological Management Plan			
13.1 Vegetation other than invasive species (i.e. both natural plants and farm plants) is damaged or destroyed unnecessarily – beyond the agreed boundaries, particularly natural plants in the forested sections between Saclapea and Tappita.	• Only cut vegetation that is in the way. This means plants that are in the direct area required for the agreed works. • Do not cut any more vegetation than is necessary for site access and working. • Do not use fire to remove vegetation. • Do not burn cut vegetation.	Vegetation can be planted to replace that lost, but restoring species assemblages and the associated ecology takes a long time and may not always be achievable.	Covered under the same programme as for 10.1 above.

13.2 Increased but poorly controlled exploitation of forest resources, including NTFPs, as a result of improved road access, particularly natural plants in the forested sections between Saclapea and Tappita.	• Instruct workforce not to collect or purchase NTFPs on site or in markets between Ganta and Tappita. • Avoid all use of fire. • Provide workers with food from domesticated plants when they are living in places where there is no market source of it.	The elimination of the use of forest products, including NTFPs is unlikely, but its use needs to be limited to sustainable levels.	Covered under the same programme as for 1.2 above.
13.3 Wild animals other than very common or nonnative pest species are killed, particularly in the	• Instruct workforce not to hunt, deal in or transport bushmeat on site. • Provide meat from domestic animals if there is no alternative. • Avoid all use of fire. • Provide workers with workers meat from	The complete elimination of the use of proscribed bushmeat is unlikely, although its consumption can be limited.	Covered under the same programme as for 1.2 above.
forested sections between Saclapea and Tappita.	domesticated animals when they are living in places where there is no market source of it.		
14. Noise and Vibration Management			

14.1 Noise disturbance at excessive levels from construction activities, quarries, borrow areas and batching plants.	• Minimise site-generated noise to the greatest possible extent. • Do not allow works to occur during the hours of darkness (6 pm to 6 am), on Sundays and religious holidays, other than in exceptional circumstances (such as casting bridge slabs). • Provide warnings of blasting, starting at least 24 hours ahead, and ensure no one is within the 500metre clearance zone. • Provide communities, through the CLO, with details of the works programme. • Do not deviate from the agreed timing of works. • Provide all site workers exposed to noise over 70 dB(A) with ear protection. • Do not allow any person to come close to a machine without having ear protection in place.	Construction noise will inevitably be disturbing in rural areas with low ambient noise levels, although it should be feasible to keep it within legal limits.	Covered under the same programme as for 1.2 above. It should also be covered through the contractors automatically following good management practices.

7.5 Estimated Cost for ESM Implementation

The ESMP implementation budget refers to all costs that will be incurred to implement the requirements or recommendations in this Environmental and Social Management Plan (ESMP). In the ESMP the requirements are to ensure that implementation of the project integrates environmental and social issues for the sustainability of the project as well as its components and sub-components. Among other things the ESMP recommends the following key issues namely: implementation and management of this ESMPs, preparation of sitespecific ESIAs, training and capacity building, environmental screening, reviewing and monitoring mechanisms. These issues have been amplified and are clearly described in this ESMP. The staff who will be involved in the implementation of the project should be trained to enhance their skills on specific environmental and social issues.

Building the capacity of staff from the implementing unit, division/departments/ sections especially those who will directly be involved in implementing the project and its subprojects, value chain systems as well as Management and Finance will enable them to review and monitor environmental issues in the project as well as sub-projects to ensure compliance with requirements of the national policies, laws, and regulations as well as AfDB safeguard policies. Detailed breakdown of the estimated cost for implementation of the ESMP is provided in Table 17 below.

Table 20: Detailed Itemized Cost for the Implementation of the ESMP and RAP: MRU/RDTFP Phase-III: Paving of Kelipo to Putuken (11.5km) to John Davis Town (50km) is 61.5km total length of project corridor in River Gee and Grand Gedeh counties

No.	Activity	Timeframe	Cost $ (USD)	Responsibility
1	**Involuntary Displacement/Resettlement Cost and Associated Cost (for total road length of 61.5km)**			
	OS5: Involuntary Displacement/Resettlement	Before the start of Construction	US$1,834,298	GOL/AfDB

	Cost for full RAP Implementation along the Putuken-John Davis Town (50km) in River Gee and Grand Gedeh counties			
	OS5: Involuntary Displacement/Resettlement Cost for full RAP Implementation along the Kelipo-Putuken (11.5km) in River Gee County	Before the start of Construction	US$346, 283.78	GOL/AfDB
Subtotal			US$2,180,581.78	GOL/AfDB
2	**Stakeholder Engagement Plan (SEP) and Grievance Redress Mechanism Implementation Cost and Associated cost**			
	Indicative Budget for Implementation of the GRM	Throughout the project lifecycle	US$35,710 X 3yrs/ (36 months)	GOL/AfDB
Subtotal			US$107,130	GOL/AfDB
5	**ESMP Monitoring and Reporting**			
	Regular supervision of environmental and social issues, including health and safety, ambulance, air/noise/water quality monitoring equipment, monitoring, and reporting	Throughout the project lifecycle	$350,000.00	GOL/AfDB

	HIV/AIDS, covid-19 / communicable disease awareness and prevention campaign	Quarterly Supervision (6Qs)	$30,000x6 ($180,000.00)	MPW/PIU/Contractor
	Capacity Building of Technical Officers, Environmental Matters	Annually X 3 (36 months)	$40,000x3 ($120,000.00)	GOL/AfDB
	Annual E&S audit	Annually X 3	$70,000x3 ($210,000)	GOL/AfDB
Subtotal			**$860,000.00**	
6	**Contractor's ESMP Preparation and EPA License Acquisition**			
	Preparation of the contractor's site-specific ESMP	First quarter in the pre-construction phase	$50,000.00	Contractor
	ESIA Permits/Licenses Acquisition and monitoring fees	Before the start of construction works and Annual Renewal	$58,050	MPW/Contractor
	The estimated cost of mitigation activities/measures	Throughout project implementation	$150,000.00	MPW/Contractor
Subtotal			**$258,050**	Project/Contractor/MPW
Total			US$3,405,761.78	GOL/AfDB
CONTINGENCY				
7	Contingency (10%) to deal with known	Throughout the life of the project	US$340,576.178	GOL/AfDB

	and unknown residual risks			
Subtotal			**US$340,576.178**	
Grand Total Cost			US$3,746,337.96	GOL/AfDB

The total amount of **Three Million Seven Hundred Forty-Six Thousand Three Hundred Thirty-Seven United States Dollars Ninety-Six Cents (US$3,746,337.96)** is required for the implementation of the RAP and the ESMP for both 11.5km and 50km. Of this amount, **Two Million One Hundred Eighty Thousand Five Hundred Eighty-One United States Dollars Seventy-Eight Cent (US$2,180,581.78)** will be paid directly to PAPs of both corridors under the Mano River Union Road Development and Transport Facilitation Programme (MRU/RDTFP) Phase-III: Paving of Keipo to Putuken (11.5km) to John Davis Town (50km) in River Gee and Grand Gedeh counties while the remaining **One Million Five Hundred Sixty-Five Thousand Seven Hundred Fifty-Six United States Dollars Eighteen Cent (US$1,565,756.18)** is intended for supervising the implementation of the GRM, SEP and ESMP.

7.6 Responsibilities and for ESMP Implementation

In order to ensure the sound development and effective implementation of the ESMP, it will be necessary to identify and define the responsibilities and authority of the various persons and institutions that will be involved in the project. The following entities will be involved on the implementation of this ESMP:

1. Ministry of Public Works/Infrastructure Implementation Unit (MPW/IIU)
2. Ministry of Transport (MOT) and Liberia National Police (LNP);
3. Environmental Protection Agency of Liberia (EPA);
4. Resident Engineers of River Gee and Grand Gedeh and Counties;
5. Environmental and Social Officer;
6. Contractor; and
7. Local Authority

7.6.1 The Ministry of Public Works/Infrastructure Implementation Unit

The project road is under the supervision of the Ministry of Public Works (the project proponent), as the statutory governmental agency empowered to do so. The Ministry of Public

Works has established an Infrastructure and Implementation Unit to supervise and monitor all infrastructure projects in the country, including all road projects. Therefore, the responsibility for ensuring that mitigation measures specified in this ESMP and the contract documents are implemented will lie with this unit.

7.6.2 Ministry of Transport and Liberia National Police

Road safety and accident prevention is the responsibility of the Ministry of Transport and the Liberia National Police. It will be the responsibility of the two institutions to ensure that road safety policies detailed below is implemented:

1. Mandatory use of seat belts;
2. Compulsory driver training and testing;
3. Prohibition and punishment of driving while impaired by drugs or alcohol;
4. Traffic safety education for children; and
5. Testing and inspection of all vehicles according to national vehicle safety standards.

The Ministry of Transport and Liberia National Police should also ensure the following:

1. Ensuring that post-accident emergency assistance and medical care are available to all accident victims;
2. Developing an accurate accident data recording system;
3. Conducting research and regularly monitoring the state of road safety;
4. Determining the need for further road improvements (based on accident data); and
5. Encouraging research and development of new, safety-oriented road technologies.

7.6.3 Environmental Protection Agency of Liberia (EPA)

The responsibility of EPA is to:

1. Exercise general supervision and co-ordination over all matters relating to the environment;
2. Be the principal instrument of Government in the implementation of all policies relating to the environment; and
3. Ensure that all mitigation measures proposed are actually implemented.

7.6.4 The Resident Engineers and Environmental and Social Officer

The Resident Engineer (RE) of River Gee and Grand Gedeh Counties will be appointed by the Ministry of Public Works. They will be required to oversee the construction programs and construction activities performed by the Contractor, in compliance with the present ESMP. The RE will have an Environmental and Social Officer (ESO) in its team to co-ordinate all aspects of the environment during project implementation. This will include following the construction to monitor, review and verify the implementation of the project's ESMP.

During construction, the ESO will be responsible for the following tasks:

1. Updating environmental aspects (not covered in the ESIA / EMP) during project implementation;
2. Auditing environmental and safety aspects at the work sites;
3. He shall participate in the definition of the no working-areas and the location campsite, borrow pits, quarries and other areas;
4. Recommending solutions for specific environmental problems;
5. He/She shall facilitate the creation of Community Liaison Groups and shall monitor the compliance of the social clauses of the Contract, in terms of local labour force and HIV/AIDS campaign;
6. Overseeing strategies for sensitizing the local population on health and safety problems;
7. Attending consultations held at key stages of the project with the community and interested parties;

8. He will be required to liaise with the respective Environmental Authorities on the level of compliance with the ESMP achieved by the Contractor on a regular basis for the duration of the contract;
9. Controlling and supervising the implementation of the ESMP; and
10. Preparing quarterly environmental and social progress or audits reports on the status of implementation of measures and management of work sites.

7.6.5 The Contractor

The Contractor will be appointed by the Ministry of Public Works and will be required to comply with the requirements of the ESIA/ ESMP and the Standard Specifications for Road Works in Liberia, as published by the Ministry of Public Works. This document includes specifications for environmental protection and waste disposal, borrow pit and quarry acquisition and exploitation, landscaping and grassing and so on.

7.6.6 Local Authorities

The relevant departmental officers in the local authorities of River Gee and Grand Gedeh Counties should be called upon where necessary during project implementation to provide the necessary permits and advisory services to the project implementers. Some of the areas for which the officers will be required include:

1. Approving locations for establishing work camps;
2. Involvement in relocation of project affected persons along the road;
3. Liaising with the NGOs in the project area to assist in the sensitization campaigns for HIV/ AIDS and public health to the workforce and the local community;
4. Issuing permits for tree felling, vegetation clearing, exploitation of quarries and borrow sites (whenever necessary);
5. Identifying locations for disposal of construction debris;
6. Issuing permits or relevant documentation for health and safety monitoring in accordance with local health and safety legislation and / or ILO standards.

7.7 Institutional Capacity Building Arrangements for ESMP Implementation

The MPW has vast experience in implementing donor funded projects. It is currently implementing several projects funded by AfDB, the World Bank, and other development partners. There are qualified and experienced staff both in the Infrastructure Implementation Unit and in the PIU responsible for implementing this project. The PIU has two full-time E&S staff, an Environmental Officer and a Social Safeguards Officer, who are responsible for overseeing implementation of the project ESMP and RAP. Short relevant courses in occupational health and safety (OHS) and sexual exploitation and abuse (SEA) are recommend to enhance the capacity of the E&S staff of the PIU. Several capacity building initiatives, including training workshops and public awareness sections have been identified for other stakeholders involved with the ESMP and RAP implementation.

8 STAKEHOLDER ENGAGEMENT AND PUBLIC CONSULTATION AND PARTICIPATION

Stakeholder Engagement and Public Participation Process particularly with local citizens affected by development proposals, is frequently construed as an integral aspect of successful decision making in the ESIA processes for major developments. As such, Public Participation is a policy requirement by the Government of Liberia and a mandatory procedure as stipulated in the EPA EIA Procedural Guidelines 2017.

It is an important process through which stakeholders including beneficiaries and members of public living in project areas (both public and private), are given an opportunity to contribute to the overall project design by making recommendations and raising concerns about the proposed projects before they are implemented. In addition, the process creates a sense of responsibility, commitment and local ownership for smooth implementation. Stakeholder involvement and public consultation was carried out within Weonville Township and Kilepo Kanweaken to record concerns of community dwellers.

The Stakeholder Engagements were done in order to foster mutual understanding, addressing concerns and incorporate opinions into the report. This process enabled the establishment of a communication channel between the general public and the project; and the concerns of the stakeholders to be known to the decision-making bodies at an early phase of project development.

8.1 Stakeholder Identification

Stakeholders can basically be grouped as follows:

- **Directly interested parties:** persons and (mainly) institutions who have a direct interest in the project, and who also have a more or less decisive influence on project

outcome. This is, first of all, GOL represented by MPW, i.e., the project proponent, financing institutions (AfDB), and other selected organisations.

- **Indirectly interested parties:** this is, in a very general way, the entire population of Liberia, or, in the short and medium term, at least the part of the population which expects to ac road, and with-it general living and economic conditions, improved by the project; this also includes enterprises and workers who hope to get contracts and jobs in the course of project implementation. This group, while certainly in favour of the project, has little or no direct influence on project outcome.
- **Involved parties:** these are mainly state organisations that, in their immediate function have no direct interest in the project as such, but are involved ex officio in the project preparation and implementation process. This is e.g., EPA, the entity responsible for conducting the ESIA process and of issuing the environmental licence to the project, but also other entities whose interests may be affected by the project (e.g., LEC, LWSC, those responsible for agriculture, forestry, fisheries, public health, etc.). They have a direct influence on project outcome.
- **Affected parties:** this is the population directly and physically affected by the project as such, i.e., the population living in the area where the project is located, and which will be changed by construction activities, project implementation and operation. The most direct impact on this group is loss of land and potentially housing, aspect mentioned in this report in a preliminary way and to be dealt with in detail in the RAP. To some extent, this group is obviously also an "interested party" insofar as they expect jobs and other economic advantages from the project. While this group is the one most directly affected by the project, it is also the one with the least influence on project outcome.

The focus of the participatory process in the ESIA and RAP development lies clearly on this latter group. While at least some of the directly interested stakeholders (like, LEC, LWSC, FDA, MPW, and MPW as Clients for the ESIA) and some of the involved parties (mainly

EPA as the institution finally deciding on issues related to environmental impacts) are directly involved in the Project, and automatically receive the reports, it is important that the main stakeholders, the affected parties (PAPs, project affected persons) receive adequate information on the project and are also enabled to voice their concerns and suggestions.

8.2 Consultation and Public Participation

Prior to commencing the ESIA process, the MPW/PIU held meetings with local authorities, county officials beginning with the Superintendent of Grand Gedeh County and subsequently with the Superintendent of River Gee County. Town meetings were also held and public notices were announced on rural radio stations and Project Affected Communities. The public Notice of Intent (NOI) was prepared according to the Liberia Environmental Procedural Guidelines and was posted in the two townships of the project area (Kilepo Kanweaken in River Gee County, and Petrokon cka Tiama Town in Grand Gedeh County) requesting interested individuals, organizations and stakeholders to provide their comments and feedback within one month of the announcement of the notices.

The public notice provided the public with one of the first formal notifications of the project. The notice contained a brief overview of the technical details of the Project and a description of the activities that are to be undertaken by the proponent (MPW). It also satisfied the requirements for environmental compliance for the purpose of collecting the information to prepare an approved Scoping Document and Terms of Reference (ToR) for the ESIA study, as required under the Environmental laws and guidelines.

In order to increase the publicity and inform more stakeholders, notices were also placed in various other prominent public locations such as public and private buildings and communities by the survey teams during the collection of the data. Informal interviews, public consultation meetings and Focus Group Discussions (FGDs) were conducted at various locations by the survey teams during the study. A verbal presentation on the proposed project in each of the townships were made and queries were clarified. Some

stakeholders were not keen to express their views in public therefore contact details were also made available to reluctant individuals and for those not able to attend the meetings in person. Wherever applicable and appropriate, discussion sessions with the individuals, officials and civil society organizations were made and the comments, feedback and suggestions were collected to support the preparation of the report.

8.3 Results of Public Consultation

More than 50 key informants were interviewed from March 17 to April 1, 2021 within River Gee and Grand Gedeh counties, while formal public meetings were conducted in the Townships of Putuken and Kilepo Kanweaken. The meetings were held on the 28th and 31st, March 2021 respectively and were meant to introduce the project to the communities and get better understanding of social and community structures.

Over 200 members of public attended the meetings in the project area. Several concerns were raised during these stakeholder consultations. Several issues were discussed during these meetings. The main concerns raised and responses provided are summarised below:

(i) **Employment Concerns for local residents**: Many participants raised concerns about giving local community members the opportunities to work on the project. They expressed fear about "outsiders" coming to take available jobs. They were however assured that local community members will be given opportunity to work despite the fact that people from other parts of the country will also be provided with employment opportunities. Participants were also informed about the project labour needs. The project will need skilled and unskilled labour and that most of the skilled labour required to execute the project effectively may not be available locally and even nationally is some cases.

(ii) RAP related concerns: There were several concerns raised about RAP issues, including how payment will be done and when, and whether payment will be made before demolition of structures is undertaken. Clarifications were made about project requirements to pay all project affected people before the start of work, and that those

affected will be duly informed about payment well in advance and agreement reached on how payment should be carried out before compensations are paid.

(iii) Road Safety and accidents emanating from speeding vehicles and construction machines: This was one of the main areas of concern for most the community members. Several concerns were raised about traffic management during the construction phase as well as the operation phase of the project. The participants were informed about measures in the project ESMP to manage traffic hazards during construction phase, including the institution and enforcement of speed limit as well as a mechanism in place for community residents to report dangerous and reckless driving activities. For the operation phase, participants were informed about dedicated project activities that supposed to address road safety issues.

Overall, despites all the concerns raised, there is overwhelming support for the project as its benefits clearly outweigh its potential negative environmental and social risks and impacts. Additional information on consultations results is attached as annexes.

Figure 7 A Public Consultation Meeting

9 Grievance Redress Mechanism (GRM)

9.1 GRM Overview

A Grievance Redress Mechanism (GRM) for the project has been developed to address all project related complaints including those that may arise from RAP implementation. It follows customary norms and fits into the statutory administrative process of the Government of

Liberia. The GRM also satisfies the ISS requirements of the Bank. The GRM's basis is described in the ESIA and the practical implementation of it is also given in the ESMP. Cash compensation will be paid to all PAPs whose structures, crops and/or land are to be demolished or cleared to allow for the implementation of the project.

Each individual PAP has the right to refuse the compensation rate proposed, if he/she finds the compensation to be inadequate and unfair under replacement cost. The PAP is at liberty to seek redress at the courts. The proposed process requires the PAP to first seek recourse through the Committee set up for that purpose to implement the RAP. The PAP can engage his/her own valuer to determine the compensation due. The evaluator and the Grievance Committee together with the relevant valuation will negotiate a settlement. If the PAP is still not convinced with what has been proposed, as stated above, he/she can take the case to the court for redress and the property cannot be demolished until the issue is resolved.

There is procedure set to receive grievances from local people, in case of noise, dangerous driving behaviour, destruction of any crops, or related to any aspects for resettlement. The levels of the Grievance Redress Mechanism present the various stages at which concerned stakeholders are to be involved during the grievance resolution and/or redress process. The grievance mechanism will be widely advertised to the stakeholders so that they are aware of the process, know they have the right to submit a grievance, and understand how the mechanism will work and how their grievance will be addressed. The process of information

dissemination will be part of the Stakeholder Engagement Plan that will be primarily carried out through community visits and distributing flyers. For a detailed description of the process see the RAP document prepared for this project.

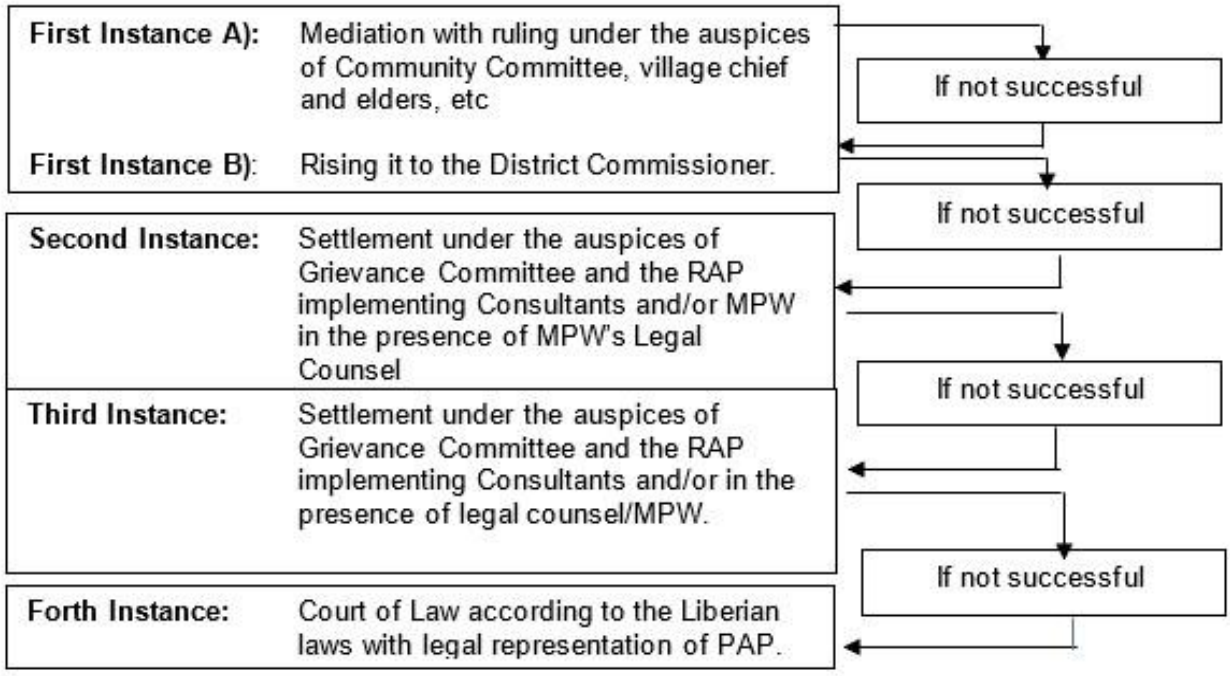

Figure 7: Levels of Project GRM

9.2 Object of the GRM

The prime objective of establishing the GRM is to resolve problems in an efficient, timely and cost-effective manner in a cordial environment with the participation of all stakeholders including affected parties. Under the GRM, it shall describe the options available to the project for grievance redress. Any environmental or social impacts (other than issues of valuation and compensation) that would be adversely affecting the general public in the project area should be resolved by the GRC. The GRM is also part and parcel of the machinery of any project. No project can claim to be accountable, responsive and user-friendly unless it has established an efficient and effective grievance redress mechanism. In fact, the grievance redress mechanism of this project (Putuken-John Davis

Town (50Km) Road) is an instrument to measure its efficiency and effectiveness as it provides important feedback on the working of the project.

The Putuken-John Davis Town (50Km) Road project is a category "A" Project hence, required the Grievance Redress Mechanism (GRM) to address issues raised by the public with regard to the project implementation since a GRM provides a predictable, transparent and credible process to all parties, resulting in outcomes that are seen as fair, effective and lasting. Subsequently, the Grievance Redress Committees (GRC) is been set up to handle all matters arising from the project. The social structure of the project implementing area is to some extent affected by the project. This caused to number of adverse social and cultural impacts to the community. As a result, it could be identified that number of psycho-social issues have been taken place. On these grounds, more attention has to be paid to the community for the successful implementation and the sustainability of the project. Also, the implementation of the GRM is required to follow the gender policy of the GOL and the African Development Bank (AfDB). Accordingly, there should be equal opportunities for men and women to be given at any stage of the GRM and to encourage women's participation in the decision-making process in development activities.

The following objectives provide benefits to both the project and affected persons:

- Establish a prompt, easy to understand, consistent and respectful mechanism to support the receiving, investigating and responding to complaints or grievances from community stakeholders;
- Ensure proper documentation of complaints or grievances and any corrective actions taken;
- Contribute to continuous improvement in performance of the Putuken-John Davis Town (50Km) Road Project through the analysis of trends and lessons learned.
- Provide a forum for redressing grievance and disputes at the lowest level;
- Create effective communication between the project and affected persons;
- Build up productive relationship among the all stakeholders including affected persons;

- Provide access to affected persons to negotiate and influence the decisions and policies of the project which might be adversely affected to them;
- Mitigates, avoid or prevents adverse impacts of the project on communities and produces appropriate corrective or preventive action;
- Harmonize both project and affected persons activities.

Grievance Redress Mechanism is part and parcel of the machinery of any project. No project can claim to be accountable, responsive and user-friendly unless it has established an efficient and effective grievance redress mechanism. In fact, the grievance redress mechanism of this project (Putuken-John Davis Town (50Km) Road) is an instrument to measure its efficiency and effectiveness as it provides important feedback on the working of the project.

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9.3 Main Principles of this GRM

- A Grievance Redress Mechanism (GRM) is proposed to address any complaints and grievances arising during the course of implementing the project. Members of the public may perceive risks to themselves or their property, or have concerns about the environmental performance of the project. Any concerns or grievances should be addressed quickly and transparently, and without reprisal to the affected person (AP) or Complainant;
- Primary principles are that all complaints and grievances are resolved as quickly as possible. It therefore follows that the resolution of complaints and grievances should be at the lowest possible level for resolution;

- All minor land or property related complaints that can be resolved, should be resolved immediately on the site. The focus of the GRM is to resolve issues in a customarily appropriate fashion at community level and record details of the complaint, the complainant and the resolution;
- All grievances from the public should be considered with equal relevance to avoid conflict of interest. Any complaints from institutions within the project area should also be treated equally as an individual complaint passing though the same system and treated equally;
- Decisions will be taken earlier are reiterated without subjecting the cases of independent examination. There is inertia to review decisions taken by down-the-line functionaries. In many cases the CLO justify the delay if any and continue with inability to take decisions by putting the onus on another petitioner. Many times, the actual cause of grievance lay in internal inefficiency of the system and failure to identify simple systemic solutions;
- There is no doubt that grievances will continue to arise because of a high systemic tolerance for delay, work quality and non-accountability in every day performance of functions. Failure to review archaic, redundant and incongruous rules, policies and procedures and to initiate simple, workable systemic changes is another cause for grievance generation. However, the committee set at local level and the Offices of the CLO will work with policies and procedures on a day-to-day basis, developed the ability to continually look 'within' and identify deficiencies.

9.4 Synopsis of the GRM Implementation

For all complaints and grievances associated with the project the following mechanisms will be used:

- All complaints about the project will be dealt with as presented within the would-be contractor's Grievance Redress Mechanism and should be recorded even if resolved immediately.
- Grievances involving compensation for (non-land) resources will be addressed using existing compensation rates developed by government agencies.

9.5 Requirements for Complaints and Grievances

In practice, complaints can be made to anyone involved in the project or perceived to be in authority either local authority, police, representatives/senators, ministers, NGOs, civil society organizations, traditional bodies, etc. Irrespective of the initial receiver of the complaint, the following will happen for Contractor related Complaints:

- All Complaints will be communicated to and registered by the community focal person or the Contractor's nominated representative usually the Contractor's Community Liaison Officer (CLO) in the site daybook immediately upon receipt, including details of the Complainant, attempts to resolve the complaint, the resolution of the complaint and outcome.

- The complaints record or daybook will be made available for inspection by any authorized representatives of the client or the PIU;

- The Contractor will inform the PIU representative on monthly basis of all complaints received including those that have been resolved;

- The PIU representative supported by the project coordinator and consultant may also assist the contractor in resolving a complaint;

- The Contractor will have a maximum of one week to resolve the complaint and convey a decision to the Complainant. The complaint and decisions on its resolution can be heard and agreed at the relevant local authority. Once resolved, the resolution should be entered accordingly into the site daybook and the CLO informed of the outcome and details included in the next Contractor's report for review and analysis by PIU representative;
- Should the Contractor or the Complainant not be satisfied with the proposed resolution of an issue or any aspect of communication around the issue, the matter will then be passed to the relevant project stakeholders (client, consultant along with contractor) for resolution;

- If the complaint escalates, that is becomes more serious over time or it appears that the Complainant may have a grievance as defined above or the complaint cannot be resolved through initial intervention and efforts by the client/consultant/contractor, it must be recorded as a grievance and the procedure for grievance redress be followed;

- The contractor's CLO will on regular basis conduct regular community representative meetings for the project including sub-project activities. These meetings will include consideration of all aspects of the project or sub-project and include discussions on nuisance, analysis of complaints and confirmation of steps to prevent or reduce nuisance and confirmation that all complaints have been resolved. Inherent causes of complaints that cannot be resolved by changes to work practices or simple on-site solutions require to be referred to the client/consultant for resolution or way forward.

- Any other complaints not necessarily relating to the Contractor shall be dealt with in the first instance by the community focal person or the CLO as applicable and recorded and sent to management.

- Results of complaints records and meetings across contractor subprojects will be reviewed regularly by the management to identify opportunities to reduce impacts of project activities and reduce complaints.

9.6 Grievances

- All grievances must be referred by the Contractor's CLO directly to management for resolution and details recorded using a Grievance Report Form (refer Annex-I);

- When a grievance is reported, it will be referred to management for resolution and if unresolved will report to client or project coordinator who may delegate this responsibility to a suitable Officer until the grievance is resolved. Where the grievance/complain is not resolved, the affected person shall proceed to a court of competent jurisdiction.

9.7 Important Notes for GRM Implementation

- Concerns, complaints and grievances from affected women, children or other vulnerable/disadvantage groups in the community may be raised by a community representative on behalf and in the same manner as a community complaint or grievance.

- Concerns, complaints, and grievances to do with the Contractor's activities within market/school/playgrounds or medical facilities or cultural heritage areas within project areas shall be raised by the School Principal, market head/officer in charge (OIC) of the health/medical facilities or traditional leader for cultural heritage areas and shall be dealt with in the same manner as a community complaint or grievance.

- Should a dispute arise, that cannot be resolved, and it is serious enough to prevent the project works taking place, then work will stop and the Contractor will be instructed

to stop work on that element of the contract until the matter is resolved. This resolution may include handling through legal processes.

All activities/works relating to this project (Putuken-John Davis Town (50Km) road) are subject to an Environmental Social Management Plan (ESMP) that has a set of conditions to be met by the Contractor. Any breaches of the ESMP conditions will also be entered into the daybook at the relevant site(s) and the resolution of the breach will be recorded.

The GRM does not deal with grievances relating to internal communication or disputes between the project team, Implementing Agency, Supervision Consultant, other agencies; nor intra/inter-community conflicts that are not project related.

- ☐ Grievances Procedure

The grievance resolution process includes four key stages – (i) Receive; (ii) Investigate/Enquire; (iii) Respond and Resolve; and (iv) Follow up/Close Out.

The intention is to resolve a complaint as quickly and at as low a level as possible to avoid a minor issue becoming a significant grievance. Unresolved complaints may be treated as grievances only if, in the opinion of the GRC Chairman that they fall within the definition of grievance under the project.

Irrespective of the stage of the process, a Complainant has the opportunity to pursue the grievance through the court as is his or her legal right.

9.9 Receiving Grievances

Relevant personnel in each project site will be required to accept formal grievances and ensure avenues for lodging grievances are accessible to the public and affected persons. Avenues will include: face to face with the contractor, PIU representative or community representative, by telephone or in writing to the above or via email.

The first point of contact for all potential grievances from community members is usually the Contractor or CLO or local authority. The grievance may be made directly by the aggrieved party or through the local chief or a community women's representative.

9.10 Investigate/Enquiry

The community focal person on committee for local level and the CLO will investigate the details of and grounds for the grievance. Additional support or information may be gathered from any other sources in order to more clearly describe the cause and effects of grievance, its level of urgency or severity and its relationship to the project.

The CLO may require that a community representative (chief or women's representative) supports the grievance in order to assist investigations and confirm details of the grievance.

Investigations may include site visits and meetings to determine: the scale and impact of the grievance and what options there may be for appropriate responses or resolutions.

9.11 Respond and Resolve

After investigation, all grievances will be responded to by contractor representative (CLO) directly to the Complainant within one week after the completion of the investigation to discuss and identify potential resolutions. If additional time is needed, the Complainant will be advised of this in advance. Any other representatives that may be required by either the CLO, or the Complainant to be present in order to provide input to developing an appropriate response or resolution.

The severity of each grievance and subsequent course of action shall be determined by the relevant supervisor (contractor or engineer). If the issue is easily resolvable, the responsible parties should endeavor to address the issue directly on site. If the grievance is a more complex issue, it may require additional meetings and further investigation, and may need to be managed by the top management including the client.

If a grievance is dismissed as groundless or resolved at any stage, the Complainant will be informed of their rights in taking it to the next stage. A copy of the decision is to be given to the Complainant in writing and a further copy sent to next level of authority to inform them of the complaint.

The records shall be kept and filed into the Grievance database managed by the CLO. All responsible parties involved in the GRM process are to keep complete records of their activities. These records of the grievance redress mechanism will be monitored by the PIU representative and include in regular project reports.

If an agreement is not reached between the Complainant and the CLO, the grievance will be escalated to management for review and a final decision. If necessary, further action will be taken to resolve the issue. If the Complainant is still dissatisfied with the outcome, they may be referred to the client or may take legal process at court level which, should be the last place for addressing grievances.

9.12 Follow-up/Close Out

A grievance is Closed Out when no further action can be or needs to be taken. All grievances should be Closed Out within the initial 30 days or as soon as possible thereafter and after all reasonable attempts to resolve the grievance have been attempted.

The response should communicate findings of the investigation and resolution, and seek approval from the Complainant. If the Complainant is satisfied with the outcome, then the grievance is closed out and they provide their signature (or fingerprint) on the agreement as confirmation.

Should the Complainant either reject or appeal the outcome then the closure status will be recorded.

Closure status will be entered into the Grievance database as follows:

- Resolved: – resolution has been agreed and implemented and signed documentation is evidence of this;

- Unresolved: – it has not been possible to reach an agreed resolution and the case has been authorized for close out by the Grievance Redress Committee Chairman or CLO;
- Abandoned: – cases where the attempts to contact the Complainant have not been successful for two months following receipt of formal grievance;

All grievances will be reviewed for opportunities to help identify and reduce future, similar occurrences across MPW road projects.

Table 18 below outlines the timeframes for each stage of the Grievance process.

Allotted Timeframe	Stage	
Within 1 day	◇	Grievance reported to Contractor through nominate person either CLO by Complainant or communit representative.
	◇	Contractor with support of Supervision Consulta prepares Grievance Report Form providing full deta c the alleged grievance.
Within 2 days	◇	CLO investigates and confirms details of the grievanc and ensures that details are entered onto the Grievanc Report Form.
	◇	CLO confirms subject of the complaint is still relevan an contacts management.
	◇	CLO sends Grievance Report Form to management.
	◇	The CLO will log grievance into the GRM register.
Within 7 days	◇	CLO informs GRC Chairman and confirms who wi have delegated authority to resolve grievance.
	◇	GRC delegate and CLO or PIU representative mee with relevant parties, village leaders etc.
	◇	Depending on nature or severity of the grievance GR delegate and PIU representative attempt to identi acceptable resolutions.
	◇	Confirm resolution with Affected Party (representative) and seek their approval or confirmatio that the grievance is resolved.
	◇	Grievance closed out by the GRC Chairman in writin informed management.
30 days	◇	If unresolved then Grievance including an update of actions to date is or referred to management for furth action.
	◇	Database updated by CLO.
As soon thereafter as possible	◇ ◇	Management undertakes further action. If grievance remains unresolved the grievance can b closed out by management on behalf of the project, ar if there exist no way out, Complainant may initiate leg process through courts
	◇	Database updated by CLO.

GRM Pathway

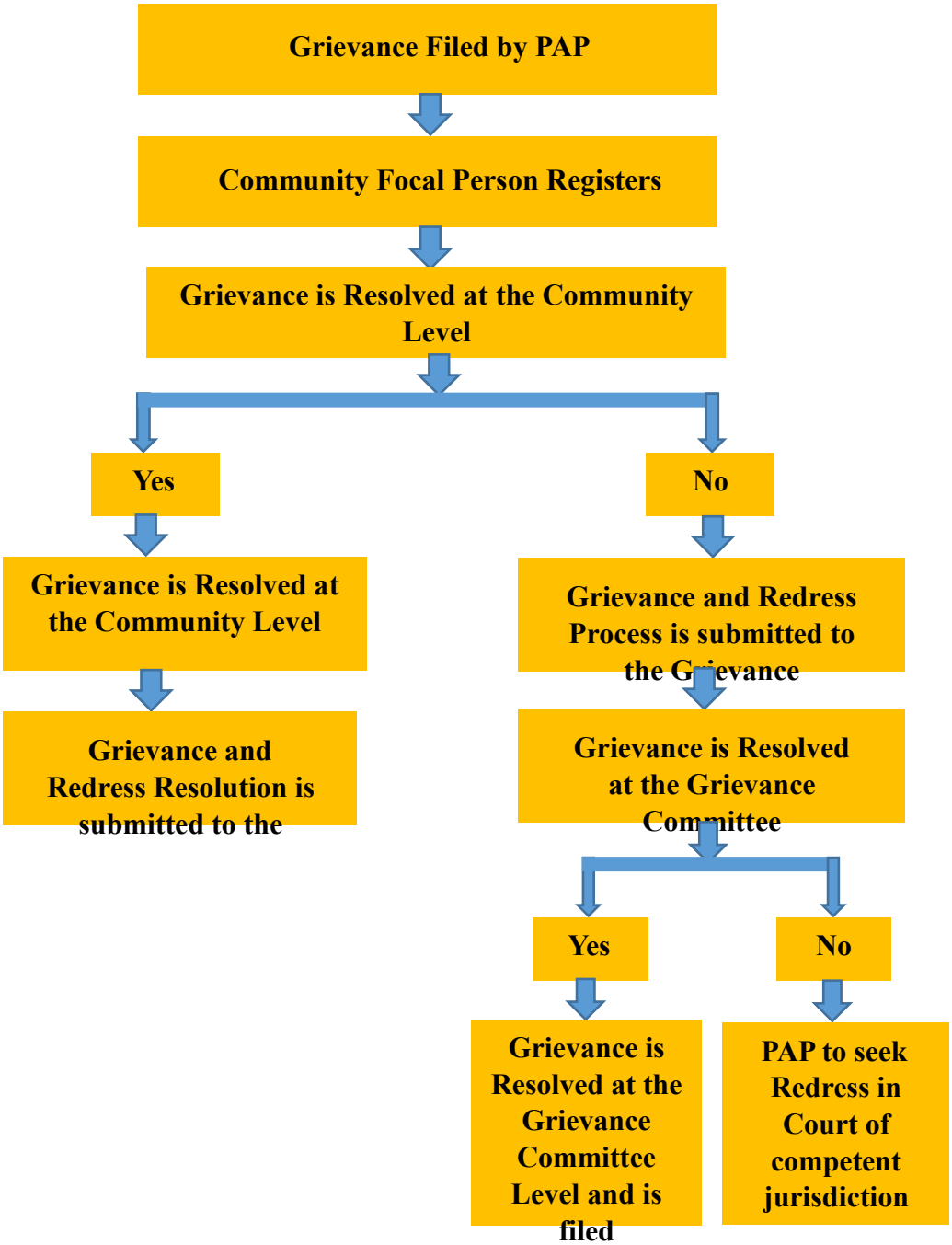

Grievance Filed by PAP
Community Focal Person Registers
Grievance is Resolved at the Community Level
Yes
No
Grievance is Resolved at the Community Level
Grievance and Redress Resolution is submitted to the
Grievance and Redress Process is submitted to the Grievance
Grievance is Resolved at the Grievance Committee
Yes
No
Grievance is Resolved at the Grievance Committee Level and is filed
PAP to seek Redress in Court of competent jurisdiction

Figure 9 Grievance Redress Mechanism Procedural diagram The table below provides detailed itemized cost for GRM implementation.

Table 19: Estimated Cost for GRM Implementation

No	Item	Cost (US Dollars)	Responsible/Source of funding
1.	Communication and awareness raising on GRM	20,000.00	PIU/MPW/GoL
2.	Establishment of GRM committees	10,000.00	PIU/MPW/GoL
3.	Transport and communication cost associated with GRM operation	20,000.00	PIU/MPW/GoL
4.	Training of various GRM committee members	15,000.00	PIU/MPW/GoL
5.	Cost for purchasing and operating equipment for GRM implementation	5,000.00	PIU/MPW/GoL
6.	Cost of monitoring and reporting GRM activities	10,000.00	PIU/MPW/GoL
7.	GRM committees Sitting (this include local level sitting)	10,000.00	PIU/MPW/GoL
8	Professional Services including Case Management System including Travel associated with complaints/requests	10,000.00	PIU/MPW/GoL
	Total budget	100,000.00	

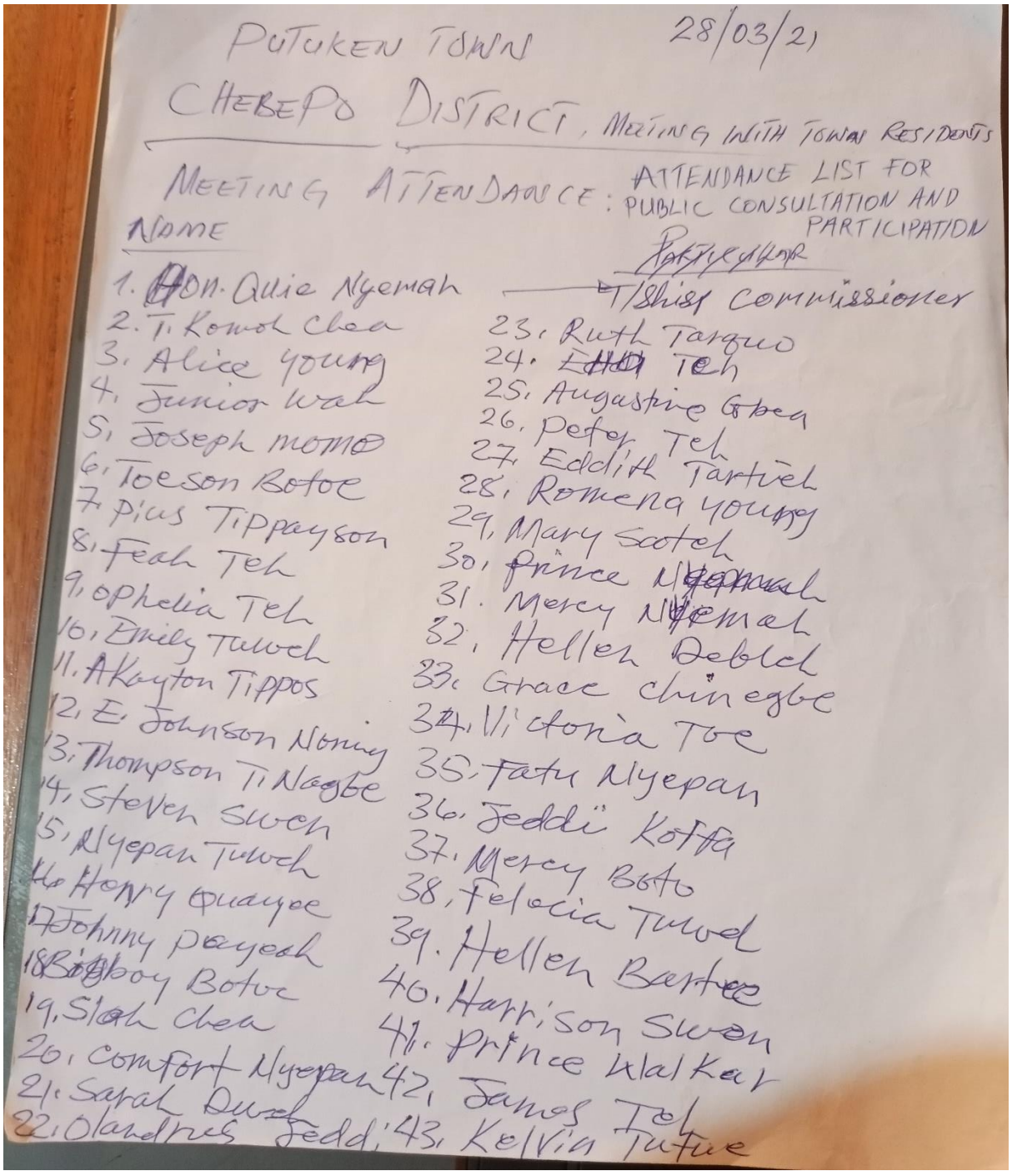
10 CONCLUSIONS

This study has clearly shown through the alternative and impact analyses as well as other sections of the report that the positive benefits to be accrued from this project enormously outweigh the associated potential environmental and social risks and impacts. There is no question that this is a worthy development for Liberia. The project is expected to generate numerous positive benefits both for the economy and the environment, including economic growth, increased in economic activities in the project counties, and boosting of the informal sector and provision of employment opportunities during the construction phase. This development also has the potential to facilitate the development of the project counties and increase their access to important services such as education and health.

Despite the numerous benefits identified, the ESIA and the RAP have identified several potential negative environmental and social risks and impacts that will need to be managed to ensure that the project is delivered in environmentally and socially acceptable manners. Amongst the main risks and impacts identified are those associated with involuntary resettlement and land acquisition triggered by project activities. The Government of Liberia is committed to ensuring that PAPs will be fully compensated to ensure that their conditions are not made worse by the project activities, in addition to implementing measures to safeguard the environment as identified in the ESMP and all other relevant project documents.

APPENDICES

APPENDIX A : Meeting Attendance: Paving Of Putuken To John Davis Town (50km) In River Gee And Grand Gedeh Counties



PUTUKEN TOWN 28/03/21

CHEDEPO DISTRICT, MEETING WITH TOWN RESIDENTS

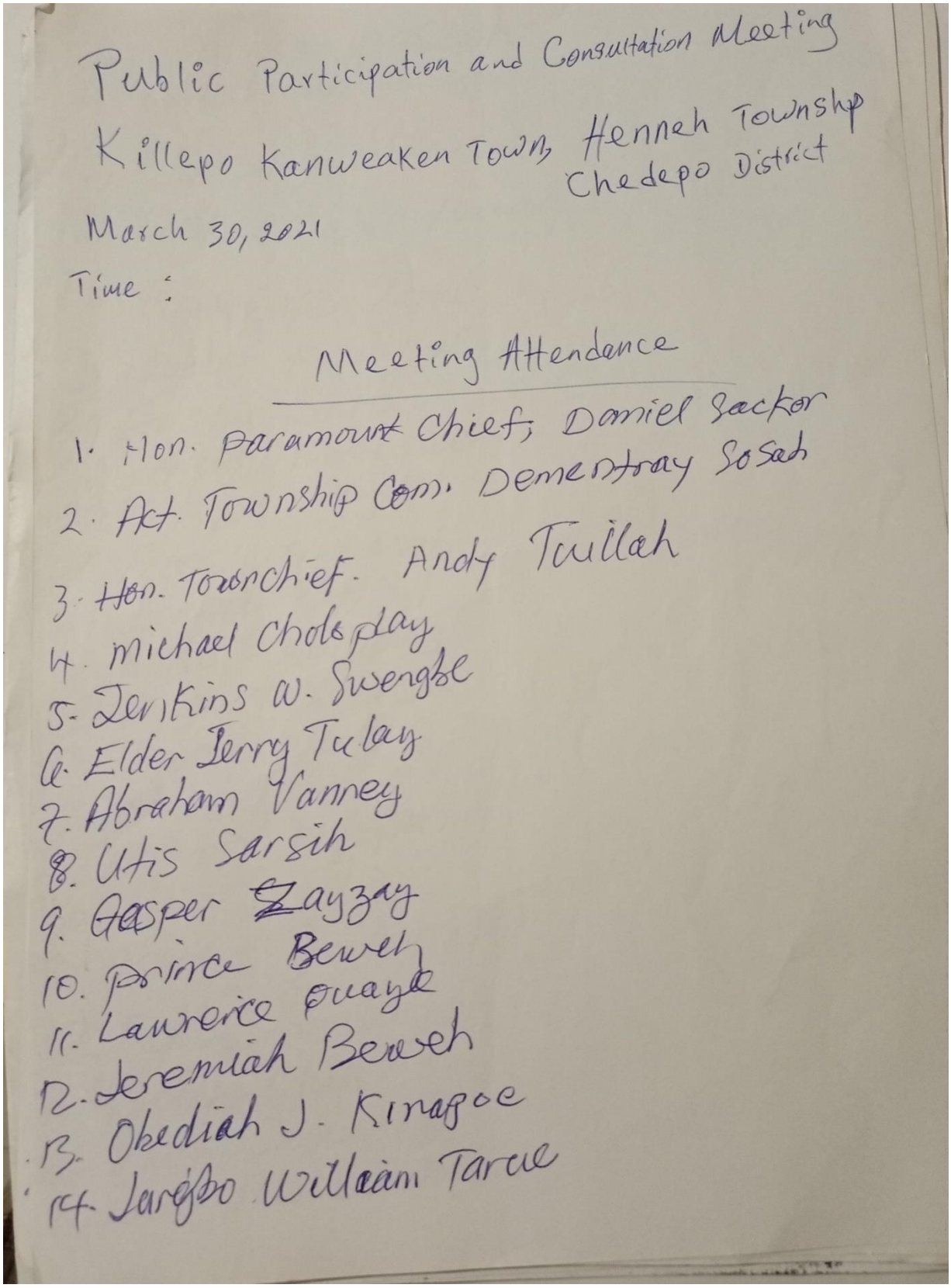
MEETING ATTENDANCE: ATTENDANCE LIST FOR PUBLIC CONSULTATION AND PARTICIPATION

NAME

1. Hon. Julia Nyemah — T/Shiaf Commissioner
2. T. Kowoh Chea
3. Alice Young
4. Junior Wah
5. Joseph Momo
6. Toeson Botoe
7. Pius Tippayson
8. Feah Teh
9. Ophelia Teh
10. Emily Tuwoh
11. Akayton Tippos
12. E. Johnson Nonny
13. Thompson T. Naagbe
14. Steven Swen
15. Nyepan Tuwoh
16. Henry Quayee
17. Johnny Peayeah
18. Boboy Botoe
19. Siah Chea
20. Comfort Nyepan
21. Sayah Duah
22. Olandus Jeddi
23. Ruth Targuo
24. Teh
25. Augustine Gbea
26. Peter Teh
27. Edclit Tartiel
28. Romena Young
29. Mary Scotch
30. Prince N[illegible]
31. Mercy N[illegible]
32. Hellen Debloh
33. Grace Chineybe
34. Victoria Toe
35. Fatu Nyepan
36. Jeddi Kotta
37. Mercy Boto
38. Felecia Tuwoh
39. Hellen Barter
40. Harrison Swen
41. Prince Walker
42. James Teh
43. Kelvin Tutue

Meeting Attendance: Women Town Hall, Putuken Town, Chedepo District in River Gee County

44. Dorris Kua
45. Dorris Toe
46. Susie Tartieh
47. Susunnah Himnoh
48. Chinegba Nyan
49. Junior Dobleh
50. Okaka Chea
51. Saving Pah
52. Perry Nyemah
53. Hellen Jebbo
54. Augustine Nyemah
55. Lawrence Teh
56. Shelton Saypee
57. Cecelia Tuweh
58. A. Weah Teh
59. Victoria Botoe
60. William Tuweh



Public Participation and Consultation Meeting

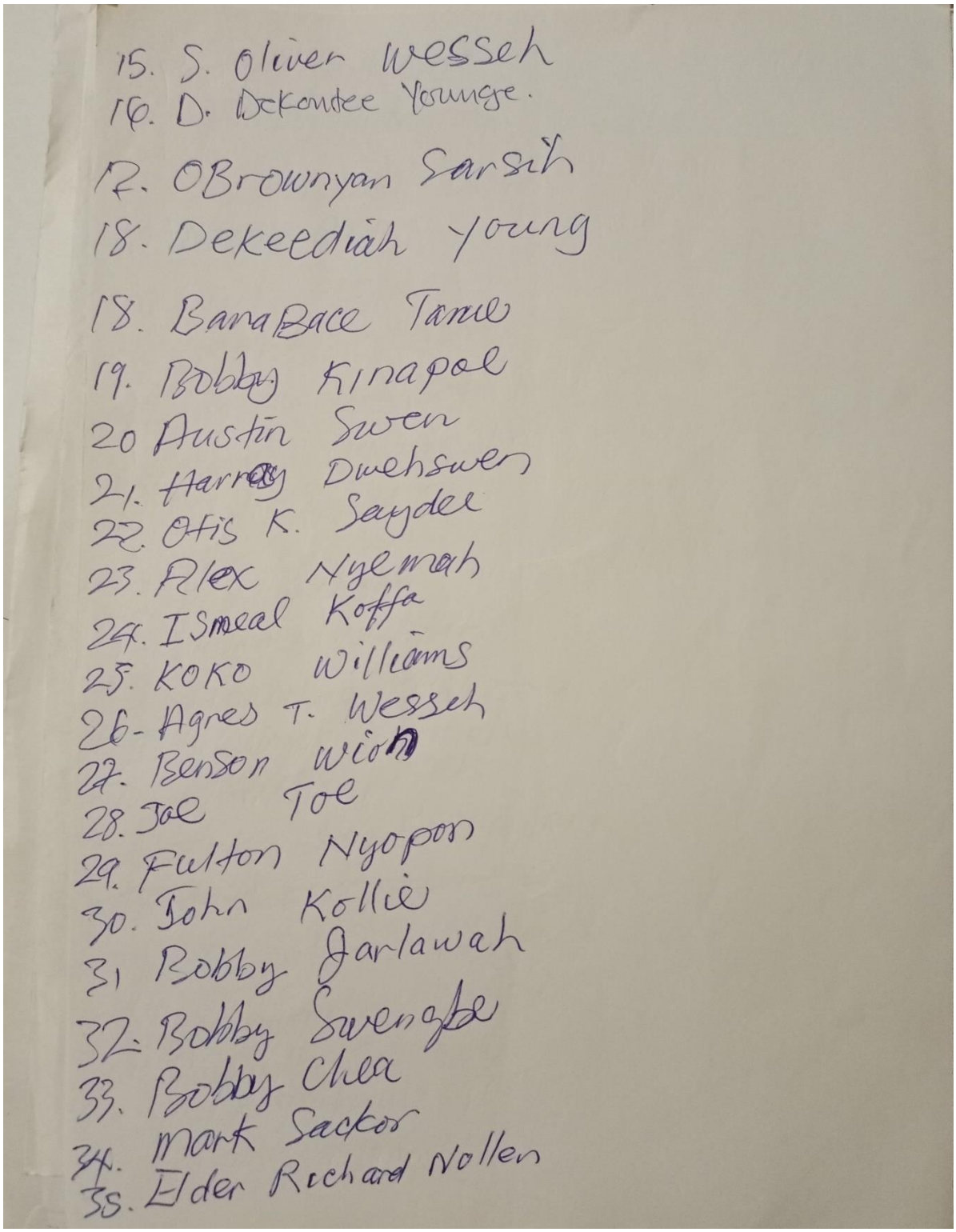
Killepo Kanweaken Town, Henneh Township
Chedepo District

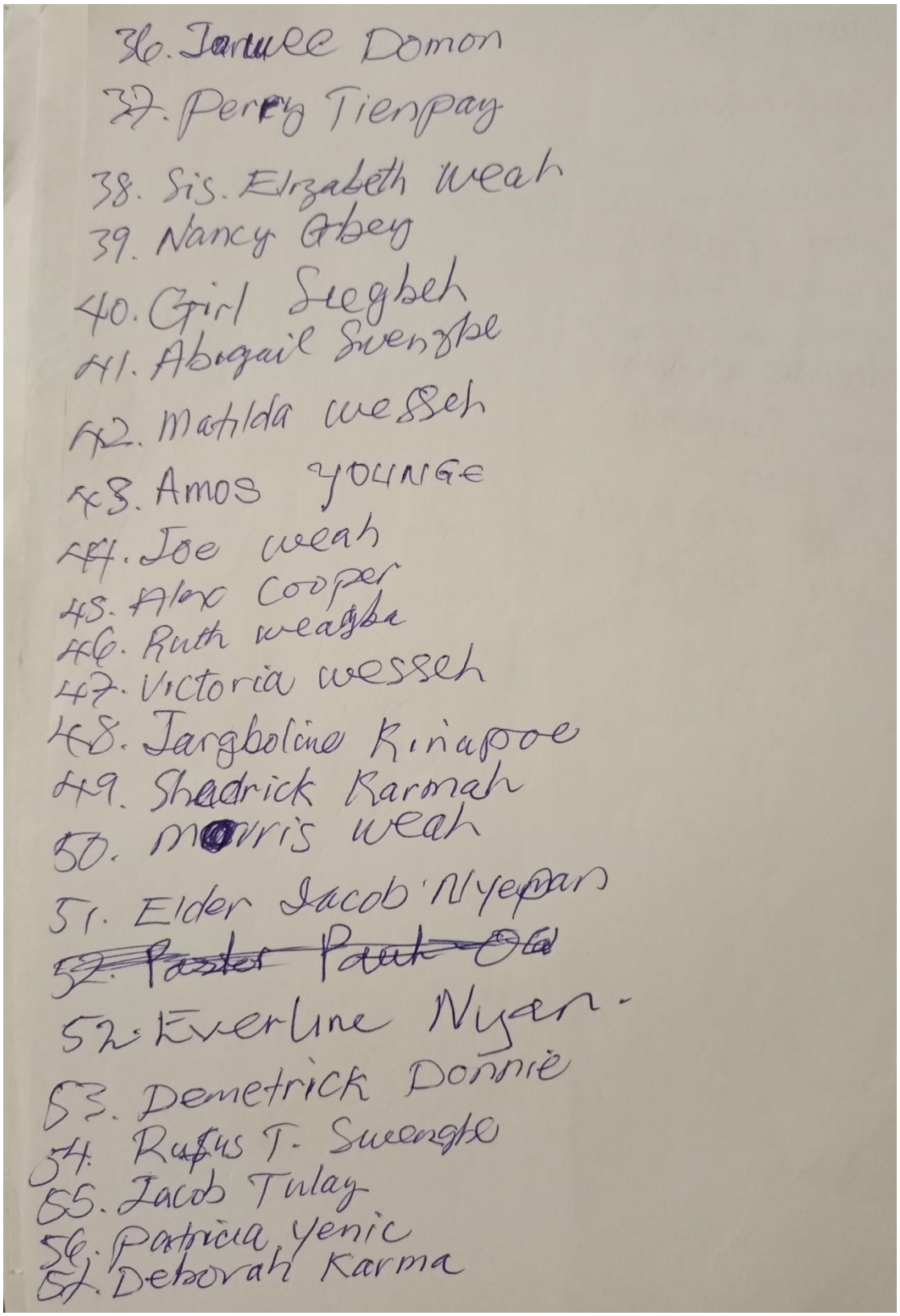
March 30, 2021

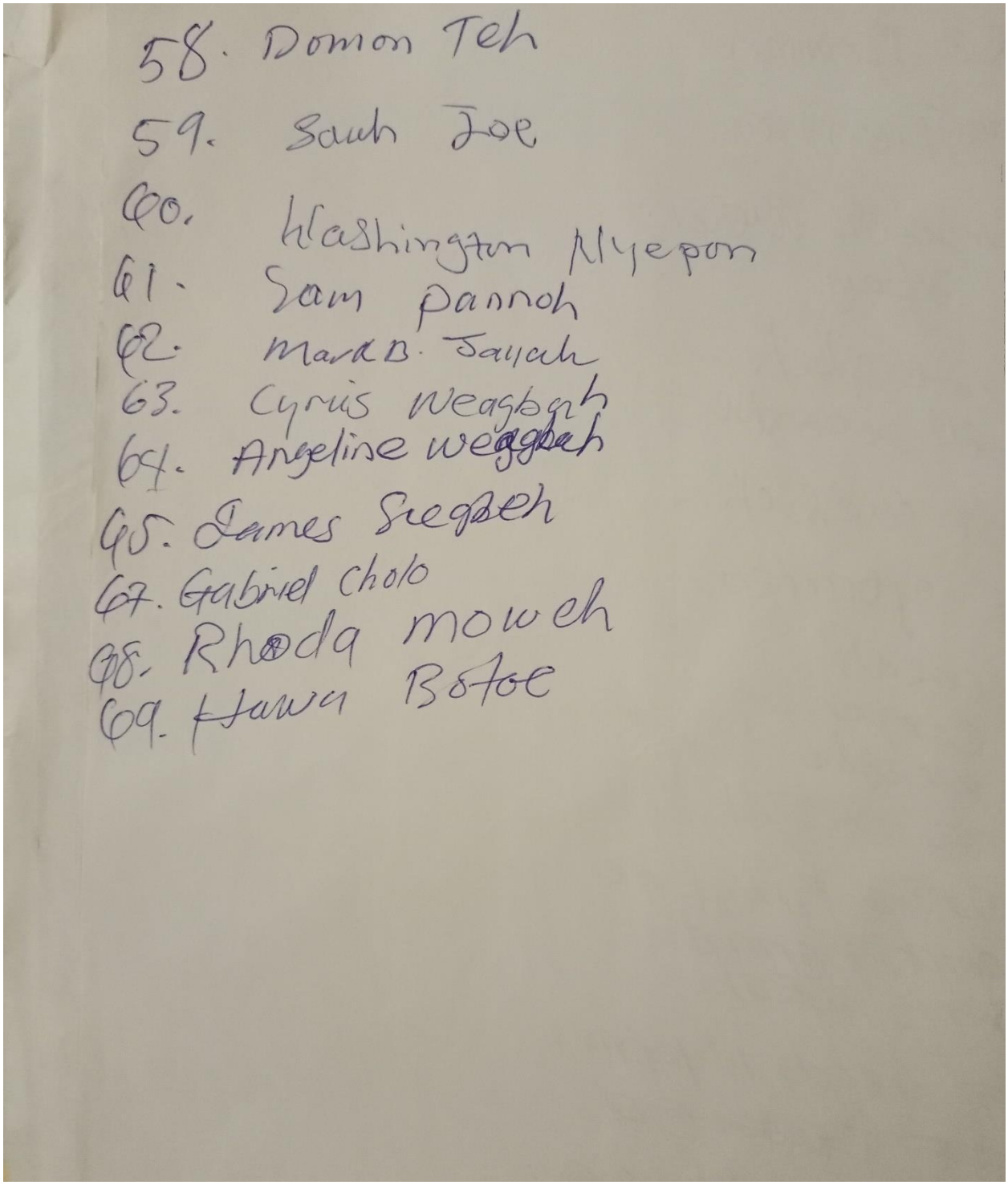
Time :

Meeting Attendance

1. Hon. Paramount Chief, Daniel Sackor
2. Act. Township Com. Demestray Sosah
3. Hon. Townchief. Andy Tuillah
4. Michael Choloplay
5. Jenkins W. Swengbe
6. Elder Jerry Tulay
7. Abraham Vanney
8. Utis Sarsih
9. Gasper Zayzay
10. Prince Beweh
11. Laurence Quayle
12. Jeremiah Beweh
13. Obediah J. Kinagoe
14. Jargbo William Tarue


15. S. Oliver Wesseh
16. D. Dekondee Younge.
17. OBrownyan Sarsih
18. Dekeediah young
18. BanaBace Tamu
19. Bobby Kinapoe
20 Austin Swen
21. Harry Dwehswen
22. Otis K. Sayde
23. Alex Nyemah
24. Ismeal Koffa
25. KOKO Williams
26- Agnes T. Wesseh
27. Benson Wion
28. Joe Toe
29. Fulton Nyopon
30. John Kollie
31 Bobby Jarlawah
32. Bobby Swengbe
33. Bobby Chea
34. Mark Sackor
35. Elder Richard Nollen


36. Jarwee Domon
37. Perry Tienpay
38. Sis. Elizabeth Weah
39. Nancy Gbey
40. Girl Sieghch
41. Abigail Swengbe
42. Mathilda wesseh
43. Amos YOUNGE
44. Joe weah
45. Alex Cooper
46. Ruth weagba
47. Victoria wesseh
48. Jargboline Kiniapoe
49. Shadrick Karmah
50. Morris Weah
51. Elder Jacob Nyepan
~~52. Pastor Paul Ola~~
52. Everline Nyan.
53. Demetrick Donnie
54. Rufus T. Sweengbe
55. Jacob Tulay
56. Patricia Yenic
57. Deborah Karma


58. Domon Teh
59. Sauh Joe
60. Washington Nyepon
61. Sam Pannoh
62. Mary B. Sallah
63. Cyrus Weagbah
64. Angeline Weagbah
65. James Sieqbeh
67. Gabriel Cholo
68. Rhoda Mowah
69. Hawa Bstoe

Appendix B: Chance Finds Procedure

The Chance Find Procedure (CFP) is a project-specific process designed to protect previously unknown cultural and heritage resources discovered during construction or project activities. It ensures that archaeological, historical, or cultural items are not disturbed until properly assessed by qualified specialists and relevant authorities.

☐ Scope

The procedure applies to all project personnel, including contractors, whose work (especially excavation and earth movement) could uncover heritage items or sites. It defines roles, responsibilities, and required response times for project staff and government authorities.

☐ Training

All workers—particularly those involved in excavation—must receive induction and ongoing toolbox training on:

- Identifying potential heritage resources
- Proper reporting procedures
- Immediate actions required upon discovery

☐ Steps to Follow if a Chance Find Occurs

If cultural resources (e.g., archaeological sites, historical artifacts, graves, cemeteries) are discovered:

- Stop work immediately in the affected area.
- Notify the foreman, who informs the Construction Manager and Environmental Officer/Manager.
- Document the find (incident report and photographs).
- Secure and delineate the site to prevent damage or theft (including night guards if needed).
- Preliminary assessment by an archaeologist to determine significance based on cultural, scientific, social, historical, or economic value.
- Minor finds: Documented and reported with minimal disruption to works.
- Significant finds: Notify relevant government authorities (e.g., MPW, Ministry of Internal Affairs, EPA, Ministry of Information, Culture and Tourism) within 7 days.
- Authorities investigate within 2 weeks and provide written guidance.
- Decisions may include redesign, preservation, restoration, or salvage excavation.
- Work resumes only after official approval.
- If no response is received within 2 weeks, authorization to proceed is assumed.

All findings must be properly recorded, including photos, communications, assessments, and final decisions.

☐ Management Options for Archaeological Sites

- Site Avoidance (Preferred Option)
  Redesign project to avoid the site.
- Mitigation (Data Recovery)
  Excavation and documentation if avoidance is not possible (costly and time-consuming).

- Site Protection
  Physical barriers, fencing, geotextile covering, or capping.

☐ Replicable vs. Non-Replicable Heritage

Replicable Heritage: Can be relocated or replaced if not critical and if project benefits outweigh losses. Management hierarchy:

- Avoid
- Minimize impacts
- Restore in situ
- Relocate
- Compensate

☐ Non-Replicable Heritage: Best preserved in situ due to irreplaceable value. Removal is allowed only when:

- Project benefits significantly outweigh cultural loss
- Approved by authorities
- Conducted using best available techniques under specialist supervision

☐ Human Remains Management

If human remains are discovered:

- Follow the same reporting and notification procedure.
  - ✓ Two main options:

☑ Avoidance (redesign project to protect remains)
☑ Exhumation and reburial, conducted respectfully and in accordance with authority guidance, including possible ceremonial requirements.

Key Principle

The core objective of the Chance Find Procedure is to ensure that cultural heritage is properly identified, protected, documented, and managed in compliance with legal and environmental safeguards before construction activities resume.

APPENDIX C: Minutes Of Stakeholder Consultation

Date	Location of Meeting	Number of Participants	Matters discussed, questions and answers
Community Consultation Meetings			
March 28, 2021	Putuken	60	• Introduction of the team • Introduction of the Project • Encouraging the Participants to be open and feel free in expressing their opinions. • Presentation of the road project (including brief history and overview of the formalities leading to the proposed construction of the 50km road, Putuken to John Davis Town) • Short presentation on the EPML and AfDB's Policy. • Summary of the impacts that might occur Question and answer session: • Main issues were access to the road, loss of property, • change in route design between preparation of RAP, • compensation aspects (graves, land, crops)

March 31, 2021	Kilepo Kanweaken	68	• Introduction • Emphasized on the essence of the ESIA and RAP process. • Provided detailed explanation on the new design. • Commented on the role of Afric Consult, Inc. as well as provided detailed information of Afric Consult, Inc.'s involvement with the project. • Distributed and provided detailed understanding of the Stakeholder Engagement Brochure, Grievance Redress Mechanism and Assets Evaluation Forms to the locals. • Posted the Assets Evaluation Form at strategic locations in the project area. • Established the cut-of- date of all affected properties (April 28, 2021). • Exemplified how the asset evaluation exercise will be carry out. Question and answer session: • Job opportunities, • compensation aspects (graves, land, crops),
Women Focus Group Discussion			

Date	Location of Meeting	Number of Participants	Matters discussed, questions and answers

April 1, 2021	Petrokon	22	• What the women know about the project and if they are participating in decision making? • Do you have access to legal title of land? • What are the livelihood activities and expected changes? • Are there specific needs for women? • What are the existing skills among the women? • What are the common diseases and the current state of health facilities? • What are the expected social impacts related to displacement? • What needs to be taken into account related to resettlement? • What are challenges in the area on women in terms of marketing of local produce? • What is the perceived percentage of educated women in the area and what can be done to improve the condition? Question and answer session: • Job opportunities, • Compensation aspects (is there the possibility of land for land and house for house compensation instead of cash)
Further Focus Group Discussions			

April 19th to 26th 2019	White Plains, Displace Camp, Zubah Town, December Town, Fire Point, Plum Hill and Raymond Camp	15	• What is the integrity of the existing water distribution network? • Is the water supply capacity adequate to provide the additional water demand to meet expanded system and expectations of the consumers? • How sustainable is the supply in the long run? ◇ Is there a monitoring procedure and components for the water distributed and supplied to track losses and value of water supplied? • What is the level of ability and willingness of consumers to pay for water as a justification for the construction of the pipeline? • What are implications to the physical environment (drainage, sanitation ahygiene) in the project area following the proposed works?
Household Questionnaire			
Date	Location of Meeting	Number of Participants	Matters discussed, questions and answers
April 19th to 26th 2019	Affected PAPs	46	• What is the expected value of the project? • What is the current source of water of the PAPs? • Willingness to pay for the project. • Expected disadvantages of the project • Major concerns and impacts expected on the communities • Road conditions • Land use and land productivity • Involvement of local community in the construction • Expected social impacts and suggestions to reduce impacts • Environmental concerns

APPENDIX D: Table Of Public Consultation

Issues	Comments
A. Value of the project in the area	
What is the main source of water for general domestic use?	Residents said that they obtained water from the following sources: Hand pumps, wells, and the mainly creeks since most hand pumps are not functioning.
Whether their main source of water is the same during the dry and wet seasons	Most of them said no. According to them, the quality of the waters is sometimes clean and sometimes dirty and they experience difficulties in getting water during dry season months and during this tense stage of the dry season, most of the water is undrinkable.
Whether they find the project construction of the road useful, and its benefits after upgrading it to the proposed standard ac road	All of them agreed that the project will be useful in terms of: • Increase productivity, market, farming, etc.; • Increased wealth creation owing to influx of investors coming to exploit the increased business potential due to good road network; • Savings arising from reduced transportation cost and time spent in traveling or commuting; • Increase in the government revenue generation; • Creation of employment during construction and operation phases of the project; and • Boost in business of construction materials and consumables especially during construction phase.
Whether they are willing to give land for contractor and engineer camps	The people of Kilepo willingly requested the team for the project to be established in the town of Kilepo Kanweaken. They are willing to give their land for camps construction;
Disadvantages of the project	• Loss of properties; • Loss of farmlands; • Change of socio-cultural setup of the community; • Water/Air/Noise pollution; • Discharge of runoff to nearby farms thus destroying crops and soil erosion issues • Vibration due to quarry rock blasting, and excavation during road work;

Major concerns regarding the upgrading the road	• Drainage and erosion concerns • Road should be constructed to standard so that it can last longer; • Disruption of services; • Health and safety standards should be followed; • Pollution; • Incidences of accidents may increase;

	• Economic growth in the area • Unlocking the potential of the high potential areas
How the road construction impact on the community	• Opening up of the place for investments; • Increased urbanization • Establishment of institutions e.g. schools and etc.; • Reduce transportation costs; • Reduce accident rate; • Improve health and schooling; • Employment opportunities to work with the construction company
B. Road condition in the area	
Prevalent mode of transport within the two Townships	Pehn-Pehn i.e. motorcycles, private transport and public transport (buses), trucks, etc.
Effects of the road condition on the community	• Delay of the farm produces reaching the market; • Waste of time and unreliable means of transport; • Accidents; • Breakdown of vehicles; hence increase in transport costs; • Delays in accessing social amenities e.g. hospitals and schools; • Hinders communication; and • Slowed down economic growth of the area.
C. Impacts on Land Use and Land Productivity	

Centers that are of major economic value along the road	• Putuken (houses largest market center in the area); • Kilepo Kanweaken (high mining activities, market center, etc.) • Petrokon (high mining activities), market center; • CVI Junction, John Davis Town (high mining activities), and etc.
Major economic activities in the two Townships	◇ Agricultural crops, Mining, livestock production; ◇ Transport; and Trade, etc.
Constraints encountered in the named economic activities	• Access to markets; • Exploitation by brokers; ◇ No access to credit facilities; • Poor infrastructure.
How the new road construction will affect land use and land productivity in the area	• Change in landscape and land use; ◇ Land value will go up; • High land utility.
D. 50Km Road Construction and Workforce	
Ways in which the local community can be involved in the road construction	• Involve the locals in unskilled labor with a priority on skilled locals; • Recruitment should be done in liaison with provincial administration; and • Use locally available raw materials supplied by locals. • Involve women in road work;
Locations recommended for the workforce	◇ Putuken, Kilepo Kanweaken, Pennokon, Petrokon, John Davis Town, etc.
Services to be provided by the local community during construction	• Security; • Catering services; • Skilled and unskilled labor; • Accommodation; • Drivers; • Grass planting on roadsides to avoid erosion; • Culvert construction; • Other engineering works
E. Social Impacts	

Impacts that the non-local workers will have on the locals	• Increased income; • Disharmony with the local communities; • Pressure on local resources; • Insecurity; • Change of socio-cultural set up; • Integration, peace building and friendship; ◇ Education/exchange of knowledge/ideas; • Disease outbreak.
Suggestions to reduce the resultant negative impacts	• Give the locals jobs; • Involve local leaders in integrating local and non-local workers; • Community policing; • HIV/AIDS awareness and malaria control programs. • Sensitization and mobilization of the community; • Increase security patrols; • No grazing along the road to avert accidents; and, • Advertise recruitment to the local community.
F. Environmental Concern	
Changes in Physical Features	Due to felling of trees along the proposed road corridor (50Km Putuken to John Davis Town), the community felt that this will negatively affect the physical appearance of the area.
Degradation of Water Courses	The communities were of the opinion that the value of the wetlands and water courses will be degraded.
Dust, Noise and Vibration	The communities expressed fears of possible increase in dust, noise and vibration especially during the construction phase e.g., quarry rock blasting, crusher plant, etc.

APPENDIX E Sample Attestation Form

Office of the General Town Chief
River Gee County, Republic of Liberia

DATE:_____

TO WHOM IT MAY CONCERN

We, the undersigned of the above Township, have approved that the property herein identified by:

Structure Code _____, located in _____

is legally owned by _____.

Kindly provide him/her all rights and privileges appertaining thereto.

Signed by: _____
Andy Tuillah
Town Chief

Attested by: _____
Boulton Dwehswen
District Commissioner
Cell#: 0778669704/0880815637

Sample of Attestation Form to be filled in by Project Affected Persons (PAPs): Paving of Putuken to John Davis Town (50Km) in River Gee & Grand Gedeh counties)

Appendix F: Photography

Public Participation and Consultation Meeting: Women Town Hall, Putuken Town, Chedepo District, River Gee County for the paving of Putuken to John Davis Town (50Km) in River Gee and Grand Gedeh counties)

Public Participation and Consultation Meeting: Kelipo Kanweaken Town Hall, Kelipo Kanweaken Town, Henneh Township, Chedepo District, River Gee County

Public Participation and Consultation Meeting: Kelipo Kanweaken Town Hall, Kelipo Kanweaken Town, Henneh Township, Chedepo District, River Gee County

Public Participation and Consultation Meeting: Kelipo Kanweaken Town Hall, Kelipo Kanweaken Town, Henneh Township, Chedepo District, River Gee County

Livelihood activities along the project corridor: Paving of Putuken to John Davis Town (50Km)

Affected Hand-Pump along the project corridor: Paving of Putuken to John Davis Town (50Km)

Fishing Activities Along the Project Corridor. Barbus inaequali identified with fisher boy along the project corridor: Paving of Putuken to John Davis Town (50Km) in River Gee and Grand Gedeh Counties